D.Kopald_1

HUD No. 10-14-0015-8 BOLI No. HUHODP131125-1150

In the Matter of the Alleged Unlawful Housing Practice Based upon Disability

Merry Callahan James Carlo,

Complainants

v.

Scott Burge, Mayor Scappoose City Council Joe Hanken, City Manager City of Scappoose Jason Meshell, Councilor Scappoose City Council Barb Hayden, Councilor Scappoose City Council Donna Gedlich, Councilor Scappoose City Council Mark Reed, Councilor Scappoose City Council Jeff Erickson, Councilor Scappoose City Council Larry Meres, President Scappoose City Council, Respondents

Conciliation Agreement



May 23, 2014

MERRY CALLAHAN 32140 RAYMOND CREEK RD SCAPPOOSE, OR 97056

SENT VIA REGULAR & CERTIFIED MAIL

RE:	Complainant:	Merry Callahan
	Respondents:	Scott Burge, Mayor
	BOLI No.:	HUHODP131125-11510
	HUD No.:	10-14-0015-8

To Whom It May Concern:

This letter is to inform you that the above-captioned complaint filed with the Civil Rights Division has been closed based upon the successful conciliation of the matter. Please find enclosed a fully signed and executed conciliation agreement.

Thank you for your assistance in reaching an amicable resolution to this matter.

Retaliation is a violation of the Fair Housing Act & ORS Chapter 659A.

Section 818 of the Fair Housing Act and ORS Chapter 659A make it unlawful to retaliate against any person because he or she has filed a housing discrimination complaint; is associated with a complainant; has counseled or otherwise assisted any person to file such a complaint; or has provided information to HUD or BOLI during a complaint investigation. Section 818 of the Fair Housing Act and ORS Chapter 659A also protect complainants against retaliatory acts that occur after a complainant has withdrawn, settled, or conciliated a housing discrimination complaint. Section 818 of the Fair Housing Act and ORS Chapter 659A protect complainants against retaliatory acts that occur after a finding of no reasonable cause. Any person who believes that he or she has been a victim of retaliation for any of the reasons listed above may file a housing discrimination complaint with HUD or BOLI within one (1) year of the date on which the most recent alleged retaliatory act(s) occurred or ended.

Sincerely,

Mare

Amy Klare Civil Rights Division Administrator sw

PORTLAND 800 NE Oregon St. Suite 1045 Portland, OR 97232-2180 (971) 673-0761 Fax (971) 673-0762

BEND Apprenticeship and Training Worksource Bend 1645 NE Forbes Rd, Ste 106 Bend, OR 97701-4990 (541) 322-2435 FAX (541) 389-8265 SALEM 3865 Wolverine St. NE; E-1 Salem, OR 97305-1268 (503) 378-3292 FAX (503) 373-7636 EUGENE 1400 Executive Parkway, Suite 200 Eugene, OR 97401-2158 (541) 686-7623 FAX (541) 686-7980

Oregon Relay TTY:711

www.oregon.gov/boli AN EQUAL OPPORTUNITY EMPLOYER MEDFORD Apprenticeship and Training 119 N Oakdale Ave. Medford, OR 97501-2629 (541) 776-6201 FAX (541) 776-6284

C)

Before the Commissioner of the Bureau of Labor and Industries of the State of Oregon

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In the Matter of the Alleged Unlawful Housing Practice Based upon Disability

Merry Callahan and James Carlo Complainant(s)

v.

Scott Burge, Mayor Scappoose City Council Jon Hanken, City Manager City of Scappoose Jason Meshell, Councilor Scappoose City Council Barb Hayden, Councilor Scappoose City Council Donna Gedlich, Councilor Scappoose City Council Mark Reed, Councilor Scappoose City Council Jeff Erickson, Councilor Scappoose City Council Larry Meres, President Scappoose City Council Respondent(s)

Conciliation Agreement

BOLI Case Number HUHODP131125-11510

HUD Case Number 10-14-0015-8

In accordance with the provisions of Chapter 659A, Oregon Revised Statutes and Oregon Administrative Rules 839-003-0000, et seq.; the Oregon Bureau of Labor and Industries (BOLI), Civil Rights Division, Merry Callahan, James Carlo, and the City of Scappoose agree to enter into this Conciliation Agreement in full settlement of the complaint filed with the Oregon Bureau of Labor and Industries, Civil Rights Division, filed on November 25, 2013, HUD Case Number 10-14-0015-8, wherein Merry Callahan and James Carlo appear as the Complainants and Scott Burge, Jon Hanken, Jason Meshell, Barb Hayden, Donna Gedlich, Mark Reed, Jeff Erickson, and Larry Meres appear as the Respondents. It is understood and agreed that this agreement is not construed as an admission of liability on the part of Respondents but is a compromise of a disputed claim. With an authorized representative for Respondent signature, all other Respondent parties are released and this matter settled. It is hereby agreed:

I. GENERAL PROVISIONS

A. PARTIES AND SUBJECT PROPERTY

- The Complainants referenced herein are Merry Callahan and James Carlo. Respondents to the filed BOLI and FHEO complaint, Title VIII Case Number 10-14-0015-8, are Scott Burge, Jon Hanken, Jason Meshell, Barb Hayden, Donna Gedlich, Mark Reed, Jeff Erickson, and Larry Meres. The subject property is 32140 Raymond Creek Rd., Scappoose, Oregon, 97056.
- 2. This agreement to be signed by City Manager Donald Otterman for the City of Scappoose and the parties agree that it releases all other Respondents.

B. STATEMENT OF FACTS

- 3. A complaint was filed on November 25, 2013, with the United States Department of Housing and Urban Development (the Department) alleging that Complainant Complainants were injured by a discriminatory act of the Respondents. Complainants allege that Respondents violated Section 804(b) or (f) of Title VIII of the Civil Rights Act of 1968 as amended in 1988, 42 U.S.C. 3601 et seq. (the Act) on the basis of disability by discriminatory terms, condition, privileges, or services and facilities and failure to make a reasonable accommodation. That complaint was co-filed with BOLI under ORS 659A.421.
- 4. Respondents deny having discriminated against Complainants, but agree to settle the claims in the underlying action by entering into this Conciliation Agreement. It is understood that this Conciliation Agreement does not constitute an admission by the Respondents of any violation of the Act, or any other law.

C. EFFECTIVE DATE

- 5. The parties expressly agree that this Agreement constitutes neither a binding contract under state or federal law nor a Conciliation Agreement pursuant to the Act, unless and until such time as it is approved by the Bureau of Labor and Industries, through the Civil Rights Division Administrator or his or her designee.
- 6. This Agreement shall become effective on the date on which it is approved by the Civil Rights Division Administrator, Bureau of Labor and Industries.

D. GENERAL PROVISIONS

7. The parties acknowledge that this Agreement is a voluntary and full settlement of the disputed complaint. The parties affirm that they have read and fully understand the terms set forth herein. No party has been coerced, intimidated, threatened or in any way forced to become a party to this Agreement.

- 8. Respondents acknowledge that they have an affirmative duty not to discriminate under the Fair Housing Act and ORS Chapter 659A, and that it is unlawful to retaliate against any person because that person has made a complaint, testified, assisted or participated in any manner in a proceeding under the Act or ORS Chapter 659A. Respondents further acknowledge that any subsequent retaliation or discrimination constitutes both a material breach of this Agreement, and a statutory violation of the Act.
- 9. This Agreement, after it has been approved by BOLI, is binding upon Respondents, their employees, heirs, successors and assigns and all others in active concert with them in the ownership or operation of the subject property.
- 10. It is understood that, pursuant to OAR 839-003-0080, upon approval of this agreement by BOLI, it is a public document.
- 11. This Agreement does not in any way limit or restrict the Department's or BOLI's authority to investigate any other complaint involving Respondents made pursuant to the Fair Housing Act or ORS Chapter 659A, or any other complaint within the Department's or BOLI's jurisdiction.
- 12. No amendment to, modification of, or waiver of any provisions of this Agreement shall be effective unless: (a) all signatories or their successors to the Agreement agree in writing to the amendment, modification or waiver; (b) the amendment, modification or waiver is in writing; and (c) the amendment, modification or waiver is approved and signed by the Civil Rights Division Administrator.
- 13. The parties agree that the execution of the Agreement may be accomplished by separate execution of consents to this Agreement, and that the original executed signature pages attached to the body of the Agreement constitute one document.
- 14. Complainant hereby forever waives, releases, and covenants not to sue the Department, BOLI, or Respondents, their heirs, executors, assigns, agents, employees and attorneys with regard to any and all claims, damages and injuries of whatever nature, whether presently known or unknown, arising out of the subject matter of BOLI Case Number HUHODP131125-11510 and HUD Case Number 10-14-0015-8 or which could have been filed in any action or suit arising from said subject matter.
- 15. Complainant agrees that this Conciliation Agreement constitutes a withdrawal of HUD Casé Number 10-14-0015-8. This release does not apply to other complaints or matters of compliance which may be pending with BOLI or the Department.
- 16. Respondents hereby forever waive, release, and covenant not to sue the Department, BOLI, or Complainant, their successors, assigns, agents, officers, board members, employees and attorneys with regard to any and all claims, damages and injuries of whatever nature, whether presently known or unknown, arising out of the subject matter of BOLI Case Number HUHODP131125-11510 and HUD Case Number 10-14-0015-8, or which could have been filed in any action or suit arising from said subject matter.

Page 3

II. RELIEF FOR COMPLAINANT

- 17. Respondents will switch the water meter at the subject property to a manual water meter (a non-electromagnetic field meter) within two weeks of the date upon which this Agreement is signed by all parties and becomes effective.
- 18. If Complainants move from the subject property to another property within the area over which Respondents have jurisdiction, Respondents will switch the water meter at the new property to a manual water meter. If Complainants have already moved into the new property at the time the request is made, Respondents will switch the water meter to a manual meter within two weeks of the date the request is made. If Complainant's have not moved into the new property at the time the request is made, Respondents will switch the water meter to a manual meter within two weeks of the date the request is made. If Complainant's have not moved into the new property at the time the request is made, Respondents will switch the water meter to manual meter before Complainants move to the new property provided that at least two weeks notice is given.
- 19. Respondents will contact Complainants' neighbors at the three adjacent properties to notify them that there is a request that the water meters at their homes be switched to manual meters. Respondents will make this request to the three adjacent neighbors in a way that it does not identify Complainants as the persons making the request or refer to Complainant's disabling condition(s). Respondents will switch the water meters at the three adjacent properties to a manual water meters within two weeks of the date upon which it learns that the neighbors do not object. Respondents and Complainants recognize that a situation may result in which one or more neighbors do object, in which case those particular water meters will not be changed.
- 20. Respondents will not charge any fees or costs to Complainants for switching the meters to manual meters or for reading the manual meters.

III. ACTIONS IN THE PUBLIC INTEREST

- 21. Respondents acknowledge that the Fair Housing Act and ORS Chapter 659A prohibit discrimination against individuals on the basis of disability. Respondents further acknowledge that these laws provide protection against being excluded from the participation in, or being denied the benefits of, equal housing opportunities or programs solely on the basis of disability.
- 22. Respondents agree to make reasonable accommodations in rules, policies, practices, or services, when such accommodations may be necessary to afford a disabled person equal opportunity to use and enjoy a dwelling or housing program.

IV. MONITORING

23. The Department and BOLI shall determine compliance with the terms of this Agreement. During the term of this Agreement, HUD and BOLI may review compliance with this Agreement. As part of such review, HUD and BOLI may inspect Respondent's property identified in Section A of this Agreement, examine witnesses and copy pertinent records of Respondents. Respondents agree to provide

Page 4

full cooperation in any monitoring review undertaken by HUD or BOLI to ensure compliance with this Agreement.

V. CONSEQUENCES OF BREACH

24. Whenever the Department has reasonable cause to believe that Respondents have breached this Agreement, the matter may be referred to the Attorney General of the United States, to commence a civil action in the appropriate U.S. District Court, pursuant to \S 810(c) and 814(b)(2) of the Act.

VII. DECLARATIONS

- 25. By approval of this agreement and upon compliance with the terms of this agreement, Complainant declares and represents full understanding of the terms of this Conciliation Agreement and voluntarily accepts the aforesaid terms for the purpose of making a full compromise and settlement of the complaint named above.
- 26. By approval of this The Oregon Bureau of Labor and Industries, Civil Rights Division, declares and represents that it will accept this settlement for the purpose of making a full compromise, adjustment, and settlement of any and all claims of, or in any way arising out of, the filing of the above-named complaint. The Division may, however, investigate any alleged breach of this agreement

NOOL Merry Callahan Complainant U James Carlo Complainant

Date:

Date: 4-29-2014

Date:

By:

By:

By:

Donald Otterman for City of Scappoose Respondent

APPROVED:

By:

By:

Mare

Amy K Klare, Administrator **Civil Rights Division**

Jolene/Goodnight, Senior Investigator Civil Rights Division

Date: $\frac{5/22/14}{5/6/14}$

Page 5

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V. CONSEQUENCES OF BREACH

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VII. DECLARATIONS

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By:

Merry Callahan Complainant

Date:

Date:

By:

By:

James Carlo Complainant

Donald Otterman for City of Scappoose Respondent

Date: 5/13/14

APPROVED:

By:

Amy K Klare, Administrator Civil Rights Division

By:

Jolene Goodnight, Senior Investigator Civil Rights Division Date: _____

Date:

D.Kopald_2

Interrogatory 1_1 (Kopald Set 1 to O&R)

Company Name: Orange and Rockland Utilities Inc. Case Description: Orange and Rockland Utilities, Inc. Electric & Gas Rate Case Case: 18-E-0067; 18-G-0068

Response to Kopald Interrogatories – Set Kopald-1 Date of Response: 5/21/2018 Responding Witness: Customer Services Panel

Question No.: 1

How many customers and other people in Orange and Rockland Utilities, Inc.'s ("ORU―) service territory have requested a smart meter opt-out?

<u>Response</u>

To date, 398 customers have requested to opt out of receiving a smart meter.

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Census Data

| Search

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QuickFacts

Rockland County, New York

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

All Topics	Rockland County, New York
Population estimates, July 1, 2017, (V2017)	328,868
L PEOPLE	
Population	
· Population estimates, July 1, 2017, (V2017)	328,868
Population estimates base, April 1, 2010, (V2017)	311,690
Population, percent change - April 1, 2010 (estimates base) to July 1, 2017, (V2017)	5.5%
Population, Census, April 1, 2010	311,687
Age and Sex	
Persons under 5 years, percent	A 7.9%
Persons under 18 years, percent	▲ 27.9%
Persons 65 years and over, percent	▲ 15.5%
Female persons, percent	▲ 51.0%
Race and Hispanic Origin	
White alone, percent	▲ 77.5%
Black or African American alone, percent (a)	▲ 13.3%
American Indian and Alaska Native alone, percent (a)	▲ 13.3% ▲ 0.5%
Asian alone, percent (a)	▲ 0.5%
Native Hawaiian and Other Pacific Islander alone, percent (a)	▲ 0.1%
Two or More Races, percent	▲ 0.1% ▲ 2.0%
Hispanic or Latino, percent (b)	▲ 2.0% ▲ 18.0%
White alone, not Hispanic or Latino, percent	▲ 18.0 % ▲ 62.7%
	• 02.7 %
Population Characteristics	0.490
Veterans, 2013-2017	9,180
Foreign born persons, percent, 2013-2017	21.4%
Housing	
Housing units, July 1, 2017, (V2017)	106,216
Owner-occupied housing unit rate, 2013-2017	68.9%
Median value of owner-occupied housing units, 2013-2017	\$425,100
Median selected monthly owner costs -with a mortgage, 2013-2017	\$3,035
Median selected monthly owner costs -without a mortgage, 2013-2017	\$1,298
Median gross rent, 2013-2017	\$1,420
Building permits, 2017	592
Families & Living Arrangements	
Households, 2013-2017	99,935
Persons per household, 2013-2017	3.18
Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017	91.5%
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	38.4%
Computer and Internet Use	
Households with a computer, percent, 2013-2017	86.9%
Households with a broadband Internet subscription, percent, 2013-2017	78.9%
Education	
High school graduate or higher, percent of persons age 25 years+, 2013-2017	87.3%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	40.4%
Health	
With a disability, under age 65 years, percent, 2013-2017	5.6%
Persons without health insurance, under age 65 years, percent	▲ 6.5%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2013-2017	65.2%
In civilian labor force, female, percent of population age 16 years+, 2013-2017	59.4%
Total accommodation and food services sales, 2012 (\$1,000) (c)	59 thi€ page help
Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	2,083(47)¥es

Total manufacturers shipments, 2012 (\$1,000) (c)	9,613,228
Total merchant wholesaler sales, 2012 (\$1,000) (c)	3,891,990
Total retail sales, 2012 (\$1,000) (c)	4,153,693
Total retail sales per capita, 2012 (c)	\$13,072
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	31.0
Income & Poverty	
Median household income (in 2017 dollars), 2013-2017	\$88,571
Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$36,898
Persons in poverty, percent	a 13.3%
BUSINESSES	
Businesses	
Total employer establishments, 2016	10,023
Total employment, 2016	110,957
Total annual payroll, 2016 (\$1,000)	5,112,186
Total employment, percent change, 2015-2016	3.8%
Total nonemployer establishments, 2016	27,661
All firms, 2012	31,220
Men-owned firms, 2012	18,538
Women-owned firms, 2012	9,433
Minority-owned firms, 2012	7,478
Nonminority-owned firms, 2012	22,494
Veteran-owned firms, 2012	1,931
Nonveteran-owned firms, 2012	27,984
GEOGRAPHY	
Geography	
Population per square mile, 2010	1,795.9

Population per square mile, 2010	1,795.9
Land area in square miles, 2010	173.55
FIPS Code	36087

About datasets used in this table

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2017) refers to the final year of the series (2010 thru 2017). Different vintage years of estimates are not comparable.

Fact Notes

- (a) Includes persons reporting only one race
- (b) (c)
- Hispanics may be of any race, so also are included in applicable race categories Economic Census Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowes interval of an open ended distribution.

- Suppressed to avoid disclosure of confidential information D
- Fewer than 25 firms F
- FN Footnote on this item in place of data
- Not available NA
- s Suppressed; does not meet publication standards
- Х Not applicable Value greater than zero but less than half unit of measure shown z

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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QuickFacts

Orange County, New York

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

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Persons under 19 years, percent	Age and Sex	
Persons 65 years and over, percent 43.8% Fernal persons, percent 43.8% Sace and Hispanic Origin 43.8% Whe adome, percent 60.0% Black or African American alon, percent (a) 60.0% American Indian and Alaska Native alone, percent (a) 60.0% Native Havesian and Other Peofic Islander alone, percent (a) 60.0% Native Havesian and Other Peofic Islander alone, percent (a) 60.0% Native Havesian and Other Peofic Islander alone, percent (a) 60.0% Versons 2013 control (b) 60.0% Versons 2013 control (b) 60.0% Versons 2013 control (b) 60.0% Versons 2013 control (c) 10.0% Versons 2013 cont	Persons under 5 years, percent	6.6%
Fernale persons, percent 4.9.9% Are enal Hispanic Origin 6.00% White alone, percent 6.00% Back or Arina nameiona none, percent (a) 6.00% Anancian Indian and Alaska Native alone, percent (a) 6.00% Asian alone, percent 0.00% Asian alone, percent 0.00% Maxies Hawaiian and Other Pecific Islander alone, percent 6.00% Two or More Races, percent 6.00% Visite alore, not lifepanic or Latino, percent 6.00% Population Characteristics 10.00% Vestars 2.012.017 10.00% Housing unit, July 1.2017, (2017) 10.00% Housing unit, July 1.2017, (2017) 66.4% Median selected monthly owner-costs-without a mortgage, 2013-2017 68.4% Median selected monthly owner-costs-without a mortgage, 2013-2017 68.4% Median selected monthly owner-costs-without a mortgage, 2013-2017 68.4% Median selected monthly owner costs without a mortgage, 2013-2017 68.4% Median selected monthly owner costs without a mortgage, 2013-2017 2.90 Median selected monthly owner costs without a mortgage, 2013-2017 2.90	Persons under 18 years, percent	a 25.5%
Stace and Hispanic Origin 6.000 While alone, percent 6.000 Black or African American alone, percent 6.000 Action and Adaska Male value, eprcent 6.000 Action and Adaska Male value, eprcent 6.000 Action American Indian and Adaska Male value, eprcent 6.000 Action American Indian and Adaska Male value, eprcent 6.000 Native Hawaian and Other Pacific Islander alone, percent 6.000 While alone, percent 6.000 While alone, percent 6.000 Voor More Roeze, walk and value, portent 2013-2017 6.000 Voor More Roeze, walk and value, portent 01 persons age 1 years, 2013-2017 2.000	Persons 65 years and over, percent	a 13.6%
White alone, percent Black of Alrican American Indian and Alaska Native alone, percent (a) 12 % Ansirican Indian and Alaska Native alone, percent (a) 0.8 % Asian alone, percent (b) 0.1 % 0.8 % 0.8 % 0.8 % 0.8 % 0.8 % 0.8 % 0.9 %	Female persons, percent	4 9.8%
Black or African American alone, percent (a) 	Race and Hispanic Origin	
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Asian alone, percent (a) 2.9% Native Havesian and Other Pacific Islander alone, percent (a) 0.1% 0.1% 0.0% <li< td=""><td>Black or African American alone, percent (a)</td><td>▲ 12.6%</td></li<>	Black or African American alone, percent (a)	▲ 12.6%
Native Hawaiian and Other Pacific Islander alone, percent (a)	American Indian and Alaska Native alone, percent (a)	▲ 0.8%
Two or More Races, percent	Asian alone, percent (a)	▲ 2.9%
Hispanic or Latino, percent (b) ▲ 20.6% White alone, not Hispanic or Latino, percent ▲ 64.1% Population Characteristics Veterans, 2013-2017 109,67 Foreign born persons, percent, 2013-2017 109,67 Housing units, July 1, 2017, (V2017) 143,310 Owner-occupied housing unit rate, 2013-2017 68.4% Median value of owner-occupied housing units, 2013-2017 828200,300 Median selected monthly owner costs - with a mortgage, 2013-2017 828200,300 Median selected monthly owner costs - with a mortgage, 2013-2017 828200,300 Median selected monthly owner costs - without a mortgage, 2013-2017 828200,300 Median selected monthly owner costs - without a mortgage, 2013-2017 828200,300 Median selected monthly owner costs - without a mortgage, 2013-2017 82820 Median selected monthly owner costs - without a mortgage, 2013-2017 82820 Median selected monthly owner costs - without a mortgage, 2013-2017 82820 Median selected monthly owner costs - without a mortgage, 2013-2017 82820 Median selected monthly owner costs - without a mortgage, 2013-2017 82820 Median selected monthly owner costs - without a mortgage, 2013-2017 82820 Median selected monthly owner costs - without a mortgage, 2013-2017 82820 Families & Living in same house 1 year ago, percent of persons age 5 years+, 2013-2017 91.3% Language other than English spoken at home, percent of persons age 5 years+, 2013-2017 91.3% Households with a computer, percent, 2013-2017 75.6% Mith a disability, under age 65 years, percent, 2013-2017 88.9% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 88.9% Persons without health insurance, under age 65 years, porcent 1628-2018 75.8% Fersons without health insurance, under age 65 years, porcent 1628-2018 75.8% Fersons without health insurance, under age 65 years, porcent 1628-2018 75.8% Fersons without health insurance, under age 65 years, porcent 1628-2017 163.4% In civilian labor force, fonal, percent of population age 16 years+, 2013-2017 89.8% In civilian labor force, fonal, percent of populati	Native Hawaiian and Other Pacific Islander alone, percent (a)	▲ 0.1%
White alone, not Hispanic or Latino, percent	Two or More Races, percent	▲ 2.9%
Population Characteristics Veterans, 2013-2017 19,967 Foreign born persons, percent, 2013-2017 10.8% Housing units, July 1, 2017, (V2017) 143,310 Owner-occupied housing unit rate, 2013-2017 68.4% Median value of owner-occupied housing units, 2013-2017 52,200 Median selected monthly owner costs - with at mortgage, 2013-2017 52,200 Median selected monthly owner costs - without at mortgage, 2013-2017 53,1187 Building persits, 2017 51,187 Building persits, 2013-2017 52,200 Median selected monthly owner costs - without at mortgage, 2013-2017 53,1187 Building persits, 2013-2017 51,187 Building persits, 2013-2017 52,600 Families & Living Arrangements 2.90 Households, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 56,804 Households with a computer, percent, 2013-2017 56,804 Households with a computer, percent, 2013-2017 56,804 Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	Hispanic or Latino, percent (b)	▲ 20.6%
veterans. 2013-201719,967Foreign born persons, percent, 2013-201710.8%Housing113,310Owner-occupied housing unit rele, 2013-201768.4%Median value of owner-occupied housing units, 2013-201752.200Median selected monthy owner costs -with a mortgage, 2013-201752.201Median selected monthy owner costs -without a mortgage, 2013-201752.201Median selected monthy owner costs -without a mortgage, 2013-201758.85Median genes rent, 2013-201710.21Median genes rent, 2013-201710.21Median genes rent, 2013-201710.21Median genes rent, 2013-201710.24Median genes rent, 2013-201710.24Households, 2013-20172.90Luing permits, 2013-20172.90Households, 2013-20172.90Luing a men buse 1 year ago, percent of persons age 1 year+, 2013-20172.90Luing a same house 1 year ago, percent of persons age 5 years+, 2013-201788.0%Households with a computer, percent, 2013-201775.6%Computer and Internet Use2.90High school graduate or higher, percent of persons age 25 years+, 2013-201789.9%Bachelor's degree or higher, percent of persons age 25 years+, 2013-20178.3%High adong and percent of porsons age 25 years+, 2013-20178.3%High adong and aduet or higher, percent of persons age 25 years+, 2013-20178.3%Bachelor's degree or higher, percent of persons age 25 years+, 2013-20178.3%High adong aduate or higher, percent of persons age 25 years+, 2013-20178.3%Pe	White alone, not Hispanic or Latino, percent	6 4.1%
Foreign born persons, percent, 2013-2017 10.8% Housing Housing units, July 1, 2017, (V2017) 143,310 Owner-occupied housing unit ate, 2013-2017 68.4% Median value of owner-occupied housing units, 2013-2017 8280,300 Median selected monthly owner costs - with a mortgage, 2013-2017 \$2,270 Median selected monthly owner costs - with a mortgage, 2013-2017 \$885 Median gross rent, 2013-2017 \$1,187 Building permits, 2017 10.21 amilies & Living Arrangements 2.90 Living in same house 1 year ago, percent of persons age 1 year*, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 5 years*, 2013-2017 2.47% Computer and Internet Use 88.0% Households with a computer, percent of persons age 5 years*, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 25 years*, 2013-2017 2.90 Education 88.0% Households with a computer, percent of persons age 25 years*, 2013-2017 2.95% Education 88.0% High school graduate or higher, percent of persons age 25 years*, 2013-2017 8.3% Barcholr's degree or higher, percent of persons age 25 years*, 201	Population Characteristics	
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Housing units, July 1, 2017, (V2017) 68.4% Median value of owner-occupied housing units, 2013-2017 68.4% Median value of owner-occupied housing units, 2013-2017 82.270 Median selected monthly owner costs -with a mortgage, 2013-2017 8885 Median selected monthly owner costs -without a mortgage, 2013-2017 8885 Median gross rent, 2013-2017 8885 Median gross rent, 2013-2017 8885 Median gross rent, 2013-2017 8885 Median gross rent, 2013-2017 2017 amilies & Living Arrangements Households, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 1 years+, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 5 years+, 2013-2017 2.90 Households with a computer, percent, 2013-2017 88.0% Households with a computer, percent, 2013-2017 7.56% Education High school graduate or higher, percent of persons age 25 years+, 2013-2017 29.5% Households with a disability, under age 65 years, percent, 2013-2017 29.5% Heath With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without health insurance, under age 16 years+, 2013-2017 8.3% Persons without health insurance, under age 16 years+, 2013-2017 5.2% Total accommodation and food services sales , 2012 (\$1,000) (c)	Foreign born persons, percent, 2013-2017	10.8%
Worker-occupied housing unit rate, 2013-2017 66.4% Median value of owner-occupied housing units, 2013-2017 52.270 Median selected monthly owner costs -with a mortgage, 2013-2017 52.270 Median selected monthly owner costs -without a mortgage, 2013-2017 52.270 Median selected monthly owner costs -without a mortgage, 2013-2017 52.270 Median selected monthly owner costs -without a mortgage, 2013-2017 58.85 Median gross rent, 2013-2017 51.187 Building permits, 2017 2.90 Persons per household, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 5 years+, 2013-2017 2.90 Louseholds, with a computer, percent, 2013-2017 2.90 Louseholds with a computer, percent, 2013-2017 88.0% Households with a computer, percent of persons age 25 years+, 2013-2017 29.5% Education 91.3% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29.5% Health 110.101.2017 29.5% With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without	Housing	
We dei an value of owner-occupied housing units, 2013-2017 \$260,000 Median value of owner-occupied housing units, 2013-2017 \$22,270 Median selected monthly owner costs - with at mortgage, 2013-2017 \$885 Median gross rent, 2013-2017 \$1,187 Building permits, 2017 10,21 Families & Living Arrangements 126,460 Persons per household, 2013-2017 2,90 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 91,3% Language other than English spoken at home, percent of persons age 5 years+, 2013-2017 91,3% Language other than English spoken at home, percent, 2013-2017 75,6% Computer and Internet Use 75,6% Households with a computer, percent, 2013-2017 58,8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 89,8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 89,8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 8,3% Persons without healt insurance, under age 65 years, percent 6,1% Economy 6,1% Textor of population age 16 years+, 2013-2017 59,2% Total accommodation and food services sales, 2012 (\$1,000) (c) \$33666*page heb	Housing units, July 1, 2017, (V2017)	143,310
Median selected monthly owner costs -with a mortgage, 2013-2017 \$2,270 Median selected monthly owner costs -without a mortgage, 2013-2017 \$885 Median gross rent, 2013-2017 \$1,187 Building permits, 2017 1,021 Families & Living Arrangements 2.90 Households, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 5 years+, 2013-2017 24.7% Computer and Internet Use 2.90 Households with a computer, percent, 2013-2017 88.0% Households with a broadband Internet subscription, percent, 2013-2017 75.6% Education 2.90 High school graduate or higher, percent of persons age 25 years+, 2013-2017 29.5% Heath 88.0% 89.8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29.5% Heath 8.3% 8.3% Persons without heatht insurance, under age 65 years, percent 8.3% Economy 6.3% 8.3% In civilian labor force, total, percent of population age 16 years+, 2013-2017 6.34% In civilian labor force, female, percent of population age 16 year	Owner-occupied housing unit rate, 2013-2017	68.4%
Median selected monthly owner costs -without a mortgage, 2013-2017 \$885 Median gross rent, 2013-2017 \$1,187 Building permits, 2017 1,021 Families & Living Arrangements 2.90 Households, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 91.3% Language other than English spoken at home, percent of persons age 5 years+, 2013-2017 24.7% Computer and Internet Use 2 Households with a computer, percent, 2013-2017 88.0% Households with a broadband Internet subscription, percent, 2013-2017 75.6% Education 29.5% High school graduate or higher, percent of persons age 25 years+, 2013-2017 89.8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 8.3% Persons without health insurance, under age 65 years, percent 8.3% Fersons without health insurance, under age 65 years, percent 8.3% Economy 6.1% Economy 6.3.4% In civilian labor force, total, percent of population age 16 years+, 2013-2017 63.4% In civilian labor force, tenale, percent of population age 16 years+, 2013-2017 59.2%	Median value of owner-occupied housing units, 2013-2017	\$260,300
We drain gross rent, 2013-2017 \$1,187 Building permits, 2017 1,021 Families & Living Arrangements 1 Households, 2013-2017 126,460 Persons per household, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 5 years+, 2013-2017 24.7% Computer and Internet Use 1 Households with a computer, percent, 2013-2017 88.0% Households with a computer, percent of persons age 25 years+, 2013-2017 89.8% Education 1 With a disability, under age 65 years, percent, 2013-2017 89.8% Persons without health insurance, under age 65 years, percent 6.1% Economy 63.4% In civilian labor force, total, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c) 1\$	Median selected monthly owner costs -with a mortgage, 2013-2017	\$2,270
Building permits, 2017 1,021 Families & Living Arrangements 126,460 Households, 2013-2017 2,00 Persons per household, 2013-2017 2,00 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 2,10 Language other than English spoken at home, percent of persons age 5 years+, 2013-2017 24,7% Computer and Internet Use 88,0% Households with a computer, percent, 2013-2017 75,6% Education 75,6% High school graduate or higher, percent of persons age 25 years+, 2013-2017 89,8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29,5% Huth a disability, under age 65 years, percent 6,1% Conomy 6,1% In civilian labor force, total, percent of population age 16 years+, 2013-2017 59,2% In civilian labor force, female, percent of population age 16 years+, 2013-2017 59,2% Total accommodation and food services sales, 2012 (\$1,000) (c) \$353665page heigh	Median selected monthly owner costs -without a mortgage, 2013-2017	\$885
Families & Living Arrangements 126,460 Households, 2013-2017 2.90 Persons per household, 2013-2017 91.3% Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 91.3% Language other than English spoken at home, percent of persons age 5 years+, 2013-2017 24.7% Computer and Internet Use 88.0% Households with a computer, percent, 2013-2017 75.6% Education 75.6% High school graduate or higher, percent of persons age 25 years+, 2013-2017 89.8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29.5% Heatth 89.8% With a disability, under age 65 years, percent 8.3% Persons without health insurance, under age 65 years, percent 6.1% Economy 63.4% In civilian labor force, total, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c) 163.4%	Median gross rent, 2013-2017	\$1,187
Households, 2013-2017 126,460 Persons per household, 2013-2017 91.3% Language other than English spoken at home, percent of persons age 1 year+, 2013-2017 91.3% Computer and Internet Use 24.7% Households with a computer, percent, 2013-2017 88.0% Households with a broadband Internet subscription, percent, 2013-2017 75.6% Education 75.6% High school graduate or higher, percent of persons age 25 years+, 2013-2017 29.5% Heatth 29.5% With a disability, under age 65 years, percent, 2013-2017 83.% Persons without health insurance, under age 65 years, percent 6.1% Economy 63.4% In civilian labor force, total, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c) 59.2%	Building permits, 2017	1,021
Persons per household, 2013-2017 2.90 Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 24.7% Computer and Internet Use Households with a computer, percent, 2013-2017 75.6% Education High school graduate or higher, percent of persons age 25 years+, 2013-2017 75.6% Education High school graduate or higher, percent of persons age 25 years+, 2013-2017 29.5% Health With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without health insurance, under age 65 years, percent Economy In civilian labor force, total, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c)	Families & Living Arrangements	
Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017 24.7% Language other than English spoken at home, percent of persons age 5 years+, 2013-2017 24.7% Computer and Internet Use Households with a computer, percent, 2013-2017 75.6% Education High school graduate or higher, percent of persons age 25 years+, 2013-2017 29.5% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29.5% Health With a disability, under age 65 years, percent, 2013-2017 6.8.3% Persons without health insurance, under age 65 years, percent Economy In civilian labor force, total, percent of population age 16 years+, 2013-2017 5.2% Total accommodation and food services sales, 2012 (\$1,000) (c)	Households, 2013-2017	126,460
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017 Computer and Internet Use Households with a computer, percent, 2013-2017 Households with a broadband Internet subscription, percent, 2013-2017 Education High school graduate or higher, percent of persons age 25 years+, 2013-2017 Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 Health With a disability, under age 65 years, percent, 2013-2017 Persons without health insurance, under age 65 years, percent Economy In civilian labor force, total, percent of population age 16 years+, 2013-2017 In civilian labor force, female, percent of population age 16 years+, 2013-2017 Total accommodation and food services sales, 2012 (\$1,000) (c)	Persons per household, 2013-2017	2.90
Computer and Internet Use 88.0% Households with a computer, percent, 2013-2017 88.0% Households with a broadband Internet subscription, percent, 2013-2017 75.6% Education 89.8% High school graduate or higher, percent of persons age 25 years+, 2013-2017 89.8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29.5% Health 29.5% With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without health insurance, under age 65 years, percent 6.1% Economy 63.4% In civilian labor force, total, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c) 155.4%	Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017	91.3%
Households with a computer, percent, 2013-2017 Households with a broadband Internet subscription, percent, 2013-2017 Education High school graduate or higher, percent of persons age 25 years+, 2013-2017 Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 Eduath With a disability, under age 65 years, percent, 2013-2017 Persons without health insurance, under age 65 years, percent In civilian labor force, total, percent of population age 16 years+, 2013-2017 In civilian labor force, female, percent of population age 16 years+, 2013-2017 Total accommodation and food services sales, 2012 (\$1,000) (c)	Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	24.7%
Households with a broadband Internet subscription, percent, 2013-2017 75.6% Education High school graduate or higher, percent of persons age 25 years+, 2013-2017 89.8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29.5% Health With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without health insurance, under age 65 years, percent 6.1% Economy In civilian labor force, total, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c)	Computer and Internet Use	
Education 89.8% High school graduate or higher, percent of persons age 25 years+, 2013-2017 89.8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29.5% Health 29.5% With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without health insurance, under age 65 years, percent 6.1% Economy 6.1% In civilian labor force, total, percent of population age 16 years+, 2013-2017 63.4% In civilian labor force, female, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c) ¥54%Fpage help	Households with a computer, percent, 2013-2017	88.0%
High school graduate or higher, percent of persons age 25 years+, 2013-2017 89.8% Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29.5% Health 29.5% With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without health insurance, under age 65 years, percent 6.1% Economy 63.4% In civilian labor force, total, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c) 1534%5page help	Households with a broadband Internet subscription, percent, 2013-2017	75.6%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017 29.5% tealth With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without health insurance, under age 65 years, percent 6.1% Economy In civilian labor force, total, percent of population age 16 years+, 2013-2017 63.4% In civilian labor force, female, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c)	Education	
Health 8.3% With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without health insurance, under age 65 years, percent	High school graduate or higher, percent of persons age 25 years+, 2013-2017	89.8%
With a disability, under age 65 years, percent, 2013-2017 8.3% Persons without health insurance, under age 65 years, percent 6.1% Economy 63.4% In civilian labor force, total, percent of population age 16 years+, 2013-2017 63.4% In civilian labor force, female, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c) 153.4%	Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	29.5%
Persons without health insurance, under age 65 years, percent Economy In civilian labor force, total, percent of population age 16 years+, 2013-2017 In civilian labor force, female, percent of population age 16 years+, 2013-2017 Total accommodation and food services sales, 2012 (\$1,000) (c)	Health	
Economy In civilian labor force, total, percent of population age 16 years+, 2013-2017 In civilian labor force, female, percent of population age 16 years+, 2013-2017 Total accommodation and food services sales, 2012 (\$1,000) (c)	With a disability, under age 65 years, percent, 2013-2017	8.3%
In civilian labor force, total, percent of population age 16 years+, 2013-2017 63.4% In civilian labor force, female, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c) 1313625 page help	Persons without health insurance, under age 65 years, percent	▲ 6.1%
In civilian labor force, female, percent of population age 16 years+, 2013-2017 59.2% Total accommodation and food services sales, 2012 (\$1,000) (c) 151AB	Economy	
Total accommodation and food services sales, 2012 (\$1,000) (c)	In civilian labor force, total, percent of population age 16 years+, 2013-2017	63.4%
Total accommodation and food services sales, 2012 (\$1,000) (c) \$354665 page help Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c) 2,176633 es	In civilian labor force, female, percent of population age 16 years+, 2013-2017	
Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	Total accommodation and food services sales, 2012 (\$1,000) (c)	5ड5대원 page help
	Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	2,17 6 🚱 (es

Total manufacturers shipments, 2012 (\$1,000) (c)	2,592,4
Total merchant wholesaler sales, 2012 (\$1,000) (c)	8,298,4
Total retail sales, 2012 (\$1,000) (c)	6,221,0
Total retail sales per capita, 2012 (c)	\$16,6
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	33
Income & Poverty	
Median household income (in 2017 dollars), 2013-2017	\$75,1
Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$32,6
Persons in poverty, percent	🔺 10.5
BUSINESSES	
Businesses	
Total employer establishments, 2016	9,4
Total employment, 2016	117,5
Total annual payroll, 2016 (\$1,000)	4,596,7
Total employment, percent change, 2015-2016	1.
Total nonemployer establishments, 2016	25,0
All firms, 2012	29,6
Men-owned firms, 2012	17,4
Women-owned firms, 2012	9,8
Minority-owned firms, 2012	5,9
Nonminority-owned firms, 2012	22,5
Veteran-owned firms, 2012	2,5
Nonveteran-owned firms, 2012	25,8
GEOGRAPHY	
Geography	
Population per square mile, 2010	45

12/17/2018

Population per square mile, 2010	459.3
Land area in square miles, 2010	811.69
FIPS Code	36071

About datasets used in this table

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2017) refers to the final year of the series (2010 thru 2017). Different vintage years of estimates are not comparable.

Fact Notes

- (a) Includes persons reporting only one race
- (b) (c)
- Hispanics may be of any race, so also are included in applicable race categories Economic Census Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowes interval of an open ended distribution.

- Suppressed to avoid disclosure of confidential information D
- Fewer than 25 firms F
- FN Footnote on this item in place of data
- Not available NA
- s Suppressed; does not meet publication standards
- Х Not applicable Value greater than zero but less than half unit of measure shown z

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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QuickFacts

Sullivan County, New York

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

Table

All Topics	Sullivan County, New York
Population estimates, July 1, 2017, (V2017)	75,485
L PEOPLE	
Population	
Population estimates, July 1, 2017, (V2017)	75,485
Population estimates base, April 1, 2010, (V2017)	77,520
Population, percent change - April 1, 2010 (estimates base) to July 1, 2017, (V2017)	-2.6%
Population, Census, April 1, 2010	77,547
Age and Sex	
Persons under 5 years, percent	▲ 5.6%
Persons under 18 years, percent	a 21.1%
Persons 65 years and over, percent	▲ 18.5%
Female persons, percent	▲ 48.6%
Race and Hispanic Origin	
White alone, percent	▲ 85.0%
Black or African American alone, percent (a)	▲ 9.9%
American Indian and Alaska Native alone, percent (a)	▲ 0.7%
Asian alone, percent (a)	1 .7%
Native Hawaiian and Other Pacific Islander alone, percent (a)	▲ 0.1%
Two or More Races, percent	▲ 2.7%
Hispanic or Latino, percent (b)	▲ 16.2%
White alone, not Hispanic or Latino, percent	▲ 71.8%
Population Characteristics	
Veterans, 2013-2017	4,832
Foreign born persons, percent, 2013-2017	9.4%
Housing	
Housing units, July 1, 2017, (V2017)	50,693
Owner-occupied housing unit rate, 2013-2017	66.9%
Median value of owner-occupied housing units, 2013-2017	\$167,900
Median selected monthly owner costs -with a mortgage, 2013-2017	\$1,582
Median selected monthly owner costs -without a mortgage, 2013-2017	\$658
Median gross rent, 2013-2017	\$860
Building permits, 2017	293
Families & Living Arrangements	
Households, 2013-2017	27,679
Persons per household, 2013-2017	2.59
Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017	87.3%
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	14.5%
Computer and Internet Use	
Households with a computer, percent, 2013-2017	82.9%
Households with a broadband Internet subscription, percent, 2013-2017	76.0%
Education	
High school graduate or higher, percent of persons age 25 years+, 2013-2017	86.4%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	23.4%
Health	
With a disability, under age 65 years, percent, 2013-2017	11.9%
Persons without health insurance, under age 65 years, percent	▲ 6.9%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2013-2017	58.5%
In civilian labor force, female, percent of population age 16 years+, 2013-2017	57.9%
Total accommodation and food services sales, 2012 (\$1,000) (c)	ୀଙ୍ କିସାହିଛି page helpf
Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	412103 ¥es

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Search

Total manufacturers shipments, 2012 (\$1,000) (c)	354,034
Total merchant wholesaler sales, 2012 (\$1,000) (c)	363,619
Total retail sales, 2012 (\$1,000) (c)	771,510
Total retail sales per capita, 2012 (c)	\$10,047
	\$10,047
Transportation	20.0
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	30.6
Income & Poverty	
Median household income (in 2017 dollars), 2013-2017	\$53,877
Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$28,224
Persons in poverty, percent	▲ 14.9%
BUSINESSES	
Businesses	
Total employer establishments, 2016	1,899
Total employment, 2016	20,221
Total annual payroll, 2016 (\$1,000)	675,636
Total employment, percent change, 2015-2016	3.6%
Total nonemployer establishments, 2016	5,616
All firms, 2012	7,128
Men-owned firms, 2012	4,130
Women-owned firms, 2012	2,105
Minority-owned firms, 2012	1,022
Nonminority-owned firms, 2012	5,754
Veteran-owned firms, 2012	650
Nonveteran-owned firms, 2012	6,144
GEOGRAPHY	
Geography	
Population per square mile, 2010	80.1

Population per square mile, 2010	80.1
Land area in square miles, 2010	968.13
FIPS Code	36105

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2017) refers to the final year of the series (2010 thru 2017). Different vintage years of estimates are not comparable.

Fact Notes

- Includes persons reporting only one race (a)
- (b) (c)
- Hispanics may be of any race, so also are included in applicable race categories Economic Census Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowes interval of an open ended distribution.

- Suppressed to avoid disclosure of confidential information D
- Fewer than 25 firms F
- FN Footnote on this item in place of data
- Not available NA
- s Suppressed; does not meet publication standards
- Х Not applicable
- Value greater than zero but less than half unit of measure shown z

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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QuickFacts

Albany County, New York

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

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or More Races, percent	Asian alone, percent (a)	▲ 7.0%
spanic or Latino, percent (b)	Native Hawaiian and Other Pacific Islander alone, percent (a)	▲ 0.1%
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tal accommodation and food services sales, 2012 (\$1,000) (c)		
tal accommodation and tood services sales, 2012 (\$1,000) (c)		
		869 1 686

Total manufacturers shipments, 2012 (\$1,000) (c)	3,547,362
Total merchant wholesaler sales, 2012 (\$1,000) (c)	4,329,619
Total retail sales, 2012 (\$1,000) (c)	5,762,775
Total retail sales per capita, 2012 (c)	\$18,866
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	20.4
Income & Poverty	
Median household income (in 2017 dollars), 2013-2017	\$62,293
Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$35,278
Persons in poverty, percent	1 1.3%
BUSINESSES	
Businesses	
Total employer establishments, 2016	9,531
Total employment, 2016	181,194
Total annual payroll, 2016 (\$1,000)	8,675,847
Total employment, percent change, 2015-2016	1.3%
Total nonemployer establishments, 2016	17,933
All firms, 2012	23,912
Men-owned firms, 2012	14,508
Women-owned firms, 2012	7,125
Minority-owned firms, 2012	3,223
Nonminority-owned firms, 2012	19,297
Veteran-owned firms, 2012	2,019
Nonveteran-owned firms, 2012	20,224
GEOGRAPHY	
Geography	
Population per square mile, 2010	581.9
Land area in square miles, 2010	522.80

FIPS Code

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36001

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2017) refers to the final year of the series (2010 thru 2017). Different vintage years of estimates are not comparable.

Fact Notes

- Includes persons reporting only one race (a)
- (b) (c)
- Hispanics may be of any race, so also are included in applicable race categories Economic Census Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowes interval of an open ended distribution.

- Suppressed to avoid disclosure of confidential information D
- Fewer than 25 firms F
- FN Footnote on this item in place of data
- Not available NA
- s Suppressed; does not meet publication standards
- Х Not applicable
- Value greater than zero but less than half unit of measure shown z

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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Diversity @ Census	Catalogs	Longitudinal Employer-	Health Insurance	Fraudulent Activity & Scams	
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Congressional and		Survey of Business Owners	International		
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QuickFacts

Columbia County, New York

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

All Topics	Columbia County, New York
Population estimates, July 1, 2017, (V2017)	60,604
L PEOPLE	
Population	
Population estimates, July 1, 2017, (V2017)	60,604
Population estimates base, April 1, 2010, (V2017)	63,066
Population, percent change - April 1, 2010 (estimates base) to July 1, 2017, (V2017)	-3.9%
Population, Census, April 1, 2010	63,096
Age and Sex	
Persons under 5 years, percent	4.3%
Persons under 18 years, percent	1 7.6%
Persons 65 years and over, percent	▲ 23.0%
Female persons, percent	4 9.8%
Race and Hispanic Origin	
White alone, percent	▲ 90.2%
Black or African American alone, percent (a)	▲ 5.3%
American Indian and Alaska Native alone, percent (a)	▲ 0.3%
Asian alone, percent (a)	▲ 2.0%
Native Hawaiian and Other Pacific Islander alone, percent (a)	▲ 0.1%
Two or More Races, percent	▲ 2.2%
Hispanic or Latino, percent (b)	4 .9%
White alone, not Hispanic or Latino, percent	▲ 86.4%
Population Characteristics	
Veterans, 2013-2017	4,214
Foreign born persons, percent, 2013-2017	6.8%
Housing	
	33,533
Owner-occupied housing unit rate, 2013-2017	72.4%
Median value of owner-occupied housing units, 2013-2017	\$224,600
Median selected monthly owner costs -with a mortgage, 2013-2017	\$1,675
Median selected monthly owner costs -without a mortgage, 2013-2017	\$654
Median gross rent, 2013-2017	\$886
Building permits, 2017	98
Families & Living Arrangements	
Households, 2013-2017	25,470
Persons per household, 2013-2017	2.32
Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017	91.8%
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	6.8%
Computer and Internet Use	
Households with a computer, percent, 2013-2017	86.0%
Households with a broadband Internet subscription, percent, 2013-2017	74.9%
Education	
High school graduate or higher, percent of persons age 25 years+, 2013-2017	89.4%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	30.1%
Health	
With a disability, under age 65 years, percent, 2013-2017	11.4%
Persons without health insurance, under age 65 years, percent	▲ 6.4%
Economy	- 0.7/0
In civilian labor force, total, percent of population age 16 years+, 2013-2017	61.4%
In civilian labor force, total, percent of population age 16 years+, 2013-2017	58.1%
Total accommodation and food services sales, 2012 (\$1,000) (c)	iš4ທີ່ຍົpage help
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Total manufacturers shipments, 2012 (\$1,000) (c)	462,64
Total merchant wholesaler sales, 2012 (\$1,000) (c)	306,0
Total retail sales, 2012 (\$1,000) (c)	748,8
Total retail sales per capita, 2012 (c)	\$11,9
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	2
Income & Poverty	
Median household income (in 2017 dollars), 2013-2017	\$61,0
Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$34,7
Persons in poverty, percent	a 10.
BUSINESSES	
Businesses	
Total employer establishments, 2016	1,7
Total employment, 2016	16,7
Total annual payroll, 2016 (\$1,000)	644,4
Total employment, percent change, 2015-2016	2.
Total nonemployer establishments, 2016	6,0
All firms, 2012	7,4
Men-owned firms, 2012	4,4
Women-owned firms, 2012	2,7
Minority-owned firms, 2012	4
Nonminority-owned firms, 2012	6,7
Veteran-owned firms, 2012	Ş
Nonveteran-owned firms, 2012	6,

12/17/2018

Population per square mile, 2010	99.4
Land area in square miles, 2010	634.71
FIPS Code	36021

About datasets used in this table

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

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The vintage year (e.g., V2017) refers to the final year of the series (2010 thru 2017). Different vintage years of estimates are not comparable.

Fact Notes

- (a) Includes persons reporting only one race
- (b) (c)
- Hispanics may be of any race, so also are included in applicable race categories Economic Census Puerto Rico data are not comparable to U.S. Economic Census data

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Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowes interval of an open ended distribution.

- Suppressed to avoid disclosure of confidential information D
- Fewer than 25 firms F
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- s Suppressed; does not meet publication standards
- Х Not applicable Value greater than zero but less than half unit of measure shown z

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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QuickFacts

Dutchess County, New York

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

All Topics	Dutchess County, New York
Population estimates, July 1, 2017, (V2017)	295,568
L PEOPLE	
Population	
Population estimates, July 1, 2017, (V2017)	295,568
Population estimates base, April 1, 2010, (V2017)	297,448
Population, percent change - April 1, 2010 (estimates base) to July 1, 2017, (V2017)	-0.6%
Population, Census, April 1, 2010	297,488
Age and Sex	
Persons under 5 years, percent	4 .6%
Persons under 18 years, percent	4 19.1%
Persons 65 years and over, percent	▲ 17.0%
Female persons, percent	▲ 50.3%
Race and Hispanic Origin	
White alone, percent	▲ 81.3%
Black or African American alone, percent (a)	4 11.7%
American Indian and Alaska Native alone, percent (a)	۵.5%
Asian alone, percent (a)	▲ 3.9%
Native Hawaiian and Other Pacific Islander alone, percent (a)	۵.1%
Two or More Races, percent	▲ 2.5%
Hispanic or Latino, percent (b)	▲ 12.3%
White alone, not Hispanic or Latino, percent	a 71.4%
Population Characteristics	
Veterans, 2013-2017	15,423
Foreign born persons, percent, 2013-2017	11.3%
Housing	
Housing units, July 1, 2017, (V2017)	120,740
Owner-occupied housing unit rate, 2013-2017	69.2%
Median value of owner-occupied housing units, 2013-2017	\$275,200
Median selected monthly owner costs -with a mortgage, 2013-2017	\$2,228
Median selected monthly owner costs -without a mortgage, 2013-2017	\$853
Median gross rent, 2013-2017	\$1,174
Building permits, 2017	489
Families & Living Arrangements	
Households, 2013-2017	107,384
Persons per household, 2013-2017	2.58
Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017	88.4%
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	15.7%
Computer and Internet Use	
Households with a computer, percent, 2013-2017	90.0%
Households with a broadband Internet subscription, percent, 2013-2017	84.3%
Education	
High school graduate or higher, percent of persons age 25 years+, 2013-2017	90.5%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	34.6%
Health	04.076
With a disability, under age 65 years, percent, 2013-2017	9.0%
Persons without health insurance, under age 65 years, percent	● 5.3%
	■ 5.3%
	00.01/
In civilian labor force, total, percent of population age 16 years+, 2013-2017	63.3%
In civilian labor force, female, percent of population age 16 years+, 2013-2017	59.6%
Total accommodation and food services sales, 2012 (\$1,000) (c) Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	49915168 2.004631

12/17/2018Total manufacturers shipments, 2012 (\$1,000) (c)2,443,406Total merchant wholesaler sales, 2012 (\$1,000) (c)4,342,005Total retail sales, 2012 (\$1,000) (c)3,792,719Total retail sales, 2012 (\$1,000) (c)\$1,2760Tansportatio\$1,2760Men travel time to work (minutes), workers age 16 years+, 2013-2017Men travel time to work (minutes), workers age 16 years+, 2013-201732.2Income & PoveryMedian household income (in 2017 dollars), 2013-2017358,704Per capita income in past 12 months (in 2017 dollars), 2013-2017358,704Persons in povery, percent10.1%10.1%Ital employer establishments, 201696,161Total employer establishments, 20164,30,161Total employer establishments, 20164,30,161Total employment, percent thange, 2015-20164,30,161Total employment, 2016 (\$1,000)4,30,161Total employment, 2016 (\$1,000)4,30,161Total employment, percent change, 2015-20164,30,161Total employment, percent change, 2015-20164,30,161Total employment, percent change, 2015-20164,30,161Total employment, percent change, 2015-20164,30,161Alt firms, 20124,24,210Menor-owned firms, 201213,305Women-owned firms, 201213,305Minority-owned firms, 20123,333Nominority-owned firms, 20123,833Nominority-owned firms, 20123,833Nominority-owned firms, 20123,833Nominority-owned firms, 20123,835			
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Total retail sales per capita, 2012 (c)\$12,56Transportation\$12,56Mean travel time to work (minutes), workers age 16 years+, 2013-2017\$32,20Income & Poverty\$10,000Median household income (in 2017 dollars), 2013-2017\$36,704Per capita income in past 12 months (in 2017 dollars), 2013-2017\$36,704Persons in poverty, percent\$10,000Image: BUSINESSES\$10,000Total employer establishments, 2016\$36,704Total employment, percent change, 2015-2016\$36,704Total employment, percent change, 2015-2016\$36,704Total employment, percent change, 2015-2016\$36,704Total employment, percent change, 2015-2016\$36,704Total employment, percent change, 2015-2016\$36,704Otal employment, percent change, 2015-2016\$36,704Mean-woned firms, 2012\$36,704Men-owned firms, 2012\$36,704Momen-owned firms, 2012<		Total merchant wholesaler sales, 2012 (\$1,000) (c)	4,342,065
TransportationMean travel time to work (minutes), workers age 16 years+, 2013-20173.2.2Income & Poverty		Total retail sales, 2012 (\$1,000) (c)	3,792,719
Mean travel time to work (minutes), workers age 16 years+, 2013-201732.2Income & PovertyMedian household income (in 2017 dollars), 2013-2017\$75,585Per capita income in past 12 months (in 2017 dollars), 2013-2017\$36,704Persons in poverty, percent\$10.1%Multise BUSINESSESBusinessesTotal employer establishments, 2016\$7,581Total employer establishments, 2016\$6,151Total annual payroll, 2016 (\$1,000)\$6,151Total employer establishments, 2016\$6,151Total onemployer establishments, 2016\$6,21,564Men-owned firms, 2012\$24,210Men-owned firms, 2012\$6,151Women-owned firms, 2012\$6,151Minority-owned f		Total retail sales per capita, 2012 (c)	\$12,756
Income & PovertyMedian household income (in 2017 dollars), 2013-2017\$75,855Per capita income in past 12 months (in 2017 dollars), 2013-2017\$36,704Persons in poverty, percent\$10.1%EUSINESSES\$10.1%Businesses\$10.1%Total employer establishments, 2016\$16,811Total employment, 2016\$16,901Total employer establishments, 2016\$16,961Total employer establishments, 2016\$16,961Men-owned firms, 2012\$16,961Minority-owned firms, 2012\$16,961Women-owned firms, 2012\$16,961Minority-owned firms, 2012\$163,905Minority-owned firms, 2012\$163,905 <td< td=""><td></td><td>Transportation</td><td></td></td<>		Transportation	
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Per capita income in past 12 months (in 2017 dollars), 2013-2017\$\$6,704Persons in poverty, percent▲ 10.1%EUSINESSESBusinessesTotal employer establishments, 2016300Total employment, 2016 \$\$1,000)400Total employment, percent change, 2015-2016400Total employment, percent change, 2015-2016400Total employment, percent change, 2015-2016400Itims, 2012400Men-owned firms, 2012400Women-owned firms, 2012400Minority-owned firms, 20124		Income & Poverty	
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■ BUSINESSESBusinessesTotal employer establishments, 2016Total employment, 2016Total omployment, 2016 (\$1,000)Total annual payroll, 2016 (\$1,000)Total employment, percent change, 2015-2016Total nonemployer establishments, 2016Total nonemployer establishments, 2016All firms, 2012Men-owned firms, 2012Women-owned firms, 2012Minority-owned firms, 2012Minority-owned firms, 2012		Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$36,704
BusinessesTotal employer establishments, 20167,581Total employment, 201696,151Total annual payroll, 2016 (\$1,000)4,301,619Total employment, percent change, 2015-2016-0.5%Total nonemployer establishments, 201621,564All firms, 201224,210Men-owned firms, 201213,505Women-owned firms, 20128,193Minority-owned firms, 20123,733		Persons in poverty, percent	1 0.1%
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Total employment, percent change, 2015-20160.5%Total nonemployer establishments, 201621,564All firms, 201224,210Men-owned firms, 2012313,505Women-owned firms, 20128,193Minority-owned firms, 20123,733			7,581
Total nonemployer establishments, 201621,564All firms, 201224,210Men-owned firms, 201213,505Women-owned firms, 20128,193Minority-owned firms, 20123,733		Total employer establishments, 2016	
All firms, 201224,210Men-owned firms, 201213,505Women-owned firms, 20128,193Minority-owned firms, 20123,733		Total employer establishments, 2016 Total employment, 2016	96,151
Men-owned firms, 201213,505Women-owned firms, 20128,193Minority-owned firms, 20123,733		Total employer establishments, 2016 Total employment, 2016 Total annual payroll, 2016 (\$1,000)	96,151 4,301,619
Women-owned firms, 20128,193Minority-owned firms, 20123,733		Total employer establishments, 2016 Total employment, 2016 Total annual payroll, 2016 (\$1,000) Total employment, percent change, 2015-2016	96,151 4,301,619 -0.5%
Minority-owned firms, 2012 3,733		Total employer establishments, 2016 Total employment, 2016 Total annual payroll, 2016 (\$1,000) Total employment, percent change, 2015-2016 Total nonemployer establishments, 2016	96,151 4,301,619 -0.5% 21,564
		Total employer establishments, 2016 Total employment, 2016 Total annual payroll, 2016 (\$1,000) Total employment, percent change, 2015-2016 Total nonemployer establishments, 2016 All firms, 2012	96,151 4,301,619 -0.5% 21,564 24,210
Nonminority-owned firms, 2012 19,633		Total employer establishments, 2016 Total employment, 2016 Total annual payroll, 2016 (\$1,000) Total employment, percent change, 2015-2016 Total nonemployer establishments, 2016 All firms, 2012 Men-owned firms, 2012	96,151 4,301,619 -0.5% 21,564 24,210 13,505
		Total employer establishments, 2016 Total employment, 2016 Total annual payroll, 2016 (\$1,000) Total employment, percent change, 2015-2016 Total nonemployer establishments, 2016 All firms, 2012 Men-owned firms, 2012 Women-owned firms, 2012	96,151 4,301,619 -0.5% 21,564 24,210 13,505 8,193

GEOGRAPHY

Veteran-owned firms, 2012

Nonveteran-owned firms, 2012

Geography	
Population per square mile, 2010	373.9
Land area in square miles, 2010	795.63
FIPS Code	36027

1,706

21,237

About datasets used in this table

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2017) refers to the final year of the series (2010 thru 2017). Different vintage years of estimates are not comparable.

Fact Notes

- (a) Includes persons reporting only one race
- (b) (c)
- Hispanics may be of any race, so also are included in applicable race categories Economic Census Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowes interval of an open ended distribution.

- Suppressed to avoid disclosure of confidential information D
- Fewer than 25 firms F
- FN Footnote on this item in place of data
- Not available NA
- s Suppressed; does not meet publication standards
- Х Not applicable Value greater than zero but less than half unit of measure shown z

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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QuickFacts

Greene County, New York

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

All Topics	Greene County, New York
Population estimates, July 1, 2017, (V2017)	47,470
L PEOPLE	
Population	
Population estimates, July 1, 2017, (V2017)	47,470
Population estimates base, April 1, 2010, (V2017)	49,218
Population, percent change - April 1, 2010 (estimates base) to July 1, 2017, (V2017)	-3.6%
Population, Census, April 1, 2010	49,221
Age and Sex	
Persons under 5 years, percent	▲ 4.2%
Persons under 18 years, percent	▲ 16.6%
Persons 65 years and over, percent	a 21.6%
Female persons, percent	4 7.8%
Race and Hispanic Origin	
White alone, percent	▲ 89.8%
Black or African American alone, percent (a)	▲ 6.4%
American Indian and Alaska Native alone, percent (a)	▲ 0.4%
Asian alone, percent (a)	▲ 1.3%
Native Hawaiian and Other Pacific Islander alone, percent (a)	▲ Z
Two or More Races, percent	▲ 2.1%
Hispanic or Latino, percent (b)	▲ 5.7%
White alone, not Hispanic or Latino, percent	▲ 85.3%
Population Characteristics	
Veterans, 2013-2017	3,364
Foreign born persons, percent, 2013-2017	6.1%
Housing	
Housing units, July 1, 2017, (V2017)	29,767
Owner-occupied housing unit rate, 2013-2017	75.8%
Median value of owner-occupied housing units, 2013-2017	\$176,100
Median selected monthly owner costs -with a mortgage, 2013-2017	\$1,532
Median selected monthly owner costs -without a mortgage, 2013-2017	\$580
Median gross rent, 2013-2017	\$876
Building permits, 2017	83
Families & Living Arrangements	
Households. 2013-2017	17.106
Persons per household, 2013-2017	2.60
Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017	94.5%
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	7.7%
Computer and Internet Use	
Households with a computer, percent, 2013-2017	83.1%
Households with a broadband Internet subscription, percent, 2013-2017	71.8%
Education	11070
High school graduate or higher, percent of persons age 25 years+, 2013-2017	85.9%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	22.0%
Health	22.070
	10.6%
With a disability, under age 65 years, percent, 2013-2017	
Persons without health insurance, under age 65 years, percent	▲ 5.7%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2013-2017	52.5%
In civilian labor force, female, percent of population age 16 years+, 2013-2017	51.9%
Total accommodation and food services sales, 2012 (\$1,000) (c)	ISସନିଙ୍ଗି page help

Total manufacturers shipments, 2012 (\$1,000) (c)	339,770
Total merchant wholesaler sales, 2012 (\$1,000) (c)	724,633
Total retail sales, 2012 (\$1,000) (c)	610,423
Total retail sales per capita, 2012 (c)	\$12,541
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	27.6
Income & Poverty	
Median household income (in 2017 dollars), 2013-2017	\$53,214
Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$27,402
Persons in poverty, percent	12.7%
BUSINESSES	
Businesses	
Total employer establishments, 2016	1,147
Total employment, 2016	10,475
Total annual payroll, 2016 (\$1,000)	348,049
Total employment, percent change, 2015-2016	1.3%
Total nonemployer establishments, 2016	3,433
All firms, 2012	4,428
Men-owned firms, 2012	2,564
Women-owned firms, 2012	1,170
Minority-owned firms, 2012	243
Nonminority-owned firms, 2012	4,063
Veteran-owned firms, 2012	423
Nonveteran-owned firms, 2012	3,729
GEOGRAPHY	
Geography	
Population per square mile, 2010	76.1

Population per square mile, 2010	76.1
Land area in square miles, 2010	647.16
FIPS Code	36039

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

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Fact Notes

- Includes persons reporting only one race (a)
- (b) (c)
- Hispanics may be of any race, so also are included in applicable race categories Economic Census Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowes interval of an open ended distribution.

- Suppressed to avoid disclosure of confidential information D
- Fewer than 25 firms F
- FN Footnote on this item in place of data
- Not available NA
- s Suppressed; does not meet publication standards
- Х Not applicable
- Value greater than zero but less than half unit of measure shown z

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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QuickFacts

Putnam County, New York

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

All Topics	Putnam County, New York
Population estimates, July 1, 2017, (V2017)	99,323
L PEOPLE	
Population	
Population estimates, July 1, 2017, (V2017)	99,323
Population estimates base, April 1, 2010, (V2017)	99,648
Population, percent change - April 1, 2010 (estimates base) to July 1, 2017, (V2017)	-0.3%
Population, Census, April 1, 2010	99,710
Age and Sex	
Persons under 5 years, percent	4 .4%
Persons under 18 years, percent	▲ 20.0%
Persons 65 years and over, percent	▲ 16.7%
Female persons, percent	▲ 50.0%
Race and Hispanic Origin	
White alone, percent	91.8%
Black or African American alone, percent (a)	▲ 3.6%
American Indian and Alaska Native alone, percent (a)	▲ 0.4%
Asian alone, percent (a)	▲ 2.3%
Native Hawaiian and Other Pacific Islander alone, percent (a)	▲ 0.1%
Two or More Races, percent	1 .9%
Hispanic or Latino, percent (b)	4 15.1%
White alone, not Hispanic or Latino, percent	4 78.6%
Population Characteristics	
Veterans, 2013-2017	4,163
Foreign born persons, percent, 2013-2017	13.3%
Housing	
Housing units, July 1, 2017, (V2017)	38,645
Owner-occupied housing unit rate, 2013-2017	81.9%
Median value of owner-occupied housing units, 2013-2017	\$357,700
Median selected monthly owner costs -with a mortgage, 2013-2017	\$2,708
Median selected monthly owner costs -without a mortgage, 2013-2017	\$1,107
Median gross rent, 2013-2017	\$1,334
Building permits, 2017	51
Families & Living Arrangements	
Households. 2013-2017	34.316
Persons per household, 2013-2017	2.82
Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017	93.1%
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	19.1%
Computer and Internet Use	
Households with a computer, percent, 2013-2017	94.0%
Households with a broadband Internet subscription, percent, 2013-2017	89.9%
Education	00.070
	92.8%
High school graduate or higher, percent of persons age 25 years+, 2013-2017	38.5%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	30.376
Health	6.00/
With a disability, under age 65 years, percent, 2013-2017	6.8%
Persons without health insurance, under age 65 years, percent	4.8%
Economy	
	66.9%
In civilian labor force, total, percent of population age 16 years+, 2013-2017	
In civilian labor force, total, percent of population age 16 years+, 2013-2017 In civilian labor force, female, percent of population age 16 years+, 2013-2017 Total accommodation and food services sales, 2012 (\$1,000) (c)	62.9% ୀନ୍ତିଏନିଡ଼ି page he

Total manufacturers shipments, 2012 (\$1,000) (c)	308,619
Total merchant wholesaler sales, 2012 (\$1,000) (c)	516,251
Total retail sales, 2012 (\$1,000) (c)	952,194
Total retail sales per capita, 2012 (c)	\$9,560
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	39.2
Income & Poverty	
Median household income (in 2017 dollars), 2013-2017	\$99,608
Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$44,063
Persons in poverty, percent	▲ 5.4%
BUSINESSES	
Businesses	
Total employer establishments, 2016	2,875
Total employment, 2016	20,972
Total annual payroll, 2016 (\$1,000)	908,354
Total employment, percent change, 2015-2016	1.0%
Total nonemployer establishments, 2016	9,352
All firms, 2012	10,790
Men-owned firms, 2012	6,376
Women-owned firms, 2012	3,373
Minority-owned firms, 2012	1,339
Nonminority-owned firms, 2012	9,078
Veteran-owned firms, 2012	756
Nonveteran-owned firms, 2012	9,632
GEOGRAPHY	
Geography	
Population per square mile, 2010	432.9
Land area in square miles, 2010	230.31

FIPS Code

36079

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

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Fact Notes

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- (b)
- Hispanics may be of any race, so also are included in applicable race categories Economic Census Puerto Rico data are not comparable to U.S. Economic Census data (c)

Value Flags

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QuickFacts

Ulster County, New York

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

All Topics	Ulster County, New York
Population estimates, July 1, 2017, (V2017)	179,417
L PEOPLE	
Population	
Population estimates, July 1, 2017, (V2017)	179,417
Population estimates base, April 1, 2010, (V2017)	182,512
Population, percent change - April 1, 2010 (estimates base) to July 1, 2017, (V2017)	-1.7%
Population, Census, April 1, 2010	182,493
Age and Sex	
Persons under 5 years, percent	4 .4%
Persons under 18 years, percent	▲ 17.9%
Persons 65 years and over, percent	1 9.3%
Female persons, percent	▲ 50.5%
Race and Hispanic Origin	
White alone, percent	8 7.4%
Black or African American alone, percent (a)	▲ 7.2%
American Indian and Alaska Native alone, percent (a)	• 0.4%
Asian alone, percent (a)	▲ 2.2%
Native Hawaiian and Other Pacific Islander alone, percent (a)	▲ Z
Two or More Races, percent	▲ 2.7%
Hispanic or Latino, percent (b)	▲ 10.3%
White alone, not Hispanic or Latino, percent	▲ 79.1%
Population Characteristics	<u> </u>
Veterans, 2013-2017	9,480
Foreign born persons, percent, 2013-2017	7.8%
	1.070
Housing	95 101
Housing units, July 1, 2017, (V2017)	85,131
Owner-occupied housing unit rate, 2013-2017	69.4%
Median value of owner-occupied housing units, 2013-2017	\$221,600
Median selected monthly owner costs -with a mortgage, 2013-2017 Median selected monthly owner costs -without a mortgage, 2013-2017	\$1,906 \$739
Median gross rent, 2013-2017	\$1,053
	336
Building permits, 2017	530
Families & Living Arrangements	22.222
Households, 2013-2017	69,662
Persons per household, 2013-2017	2.42
Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017	88.7%
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	11.1%
Computer and Internet Use	
Households with a computer, percent, 2013-2017	88.2%
Households with a broadband Internet subscription, percent, 2013-2017	81.8%
Education	
High school graduate or higher, percent of persons age 25 years+, 2013-2017	90.7%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	31.4%
Health	
With a disability, under age 65 years, percent, 2013-2017	9.3%
Persons without health insurance, under age 65 years, percent	▲ 6.5%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2013-2017	61.6%
In civilian labor force, female, percent of population age 16 years+, 2013-2017	59.9%
Total accommodation and food services sales, 2012 (\$1,000) (c)	3€7t₽i54page hel
	74 14 Yes

Total manufacturers shipments, 2012 (\$1,000) (c)	D
Total merchant wholesaler sales, 2012 (\$1,000) (c)	810,449
Total retail sales, 2012 (\$1,000) (c)	2,324,885
Total retail sales per capita, 2012 (c)	\$12,789
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	28.2
Income & Poverty	
Median household income (in 2017 dollars), 2013-2017	\$61,652
Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$32,453
Persons in poverty, percent	▲ 13.7%
BUSINESSES	
Businesses	
Total employer establishments, 2016	4,814
Total employment, 2016	46,586
Total annual payroll, 2016 (\$1,000)	1,649,387
Total employment, percent change, 2015-2016	2.2%
Total nonemployer establishments, 2016	16,264
All firms, 2012	18,362
Men-owned firms, 2012	10,455
Women-owned firms, 2012	6,287
Minority-owned firms, 2012	1,793
Nonminority-owned firms, 2012	16,060
Veteran-owned firms, 2012	1,072
Nonveteran-owned firms, 2012	16,579
GEOGRAPHY	
Geography	
Population per square mile, 2010	162.3
Land area in square miles, 2010	1,124.24

FIPS Code

36111

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2017) refers to the final year of the series (2010 thru 2017). Different vintage years of estimates are not comparable.

Fact Notes

- Includes persons reporting only one race (a)
- (b) (c)
- Hispanics may be of any race, so also are included in applicable race categories Economic Census Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowes interval of an open ended distribution.

- Suppressed to avoid disclosure of confidential information D
- Fewer than 25 firms F
- FN Footnote on this item in place of data
- Not available NA
- s Suppressed; does not meet publication standards
- Х Not applicable Value greater than zero but less than half unit of measure shown z

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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D.Kopald_4

County of Santa Cruz, CA 2012 letter

D.Kopald_5

Physicians for Safe Technology- Smart meters

Physicians for Safe Technology- Advisory Board

Statement of Cindy Russell, VP Community Health Santa Clara, CA Medical Association and member of Physicians for Safe Technology

D.Kopald_6

Environmental Health Trust-Risks Posed by Smart Meters

D.Kopald_7

Dr. Joseph Mercola- 5/8/17 article on smart meter dangers

Dr. Stephen Sinatra- Advice to a Reader claiming to have Atrial Fibrillation ("Afib") to avoid "living near Smart Meters" 11/12/2012

Dr. Stephen Sinatra- 6 Holiday Gifts to Avoid or Use with Caution

D.Kopald_8

De-Kun Li, Kaiser Permanente- Letter to FCC

De-Kun Li, Kaiser Permanente- MPUC Docket No. 2011-00262

D.Kopald_9

AAEM letter to CPUC 1-19-12 on smart meters

AAEM RF position statement- 2012

AAEM Medical conditions that benefit from PM MW RFR reduction 7/12/12



County of Santa Cruz

COUNTY ADMINISTRATIVE OFFICE

701 OCEAN STREET, SUITE 520, SANTA CRUZ, CA 95060-4073 (831) 454-2100 FAX: (831) 454-3420 TDD: (831) 454-2123 SUSAN MAURIELLO, J.D., COUNTY ADMINISTRATIVE OFFICER

January 18, 2012

AGENDA: January 24, 2012

0249

Board of Supervisors County of Santa Cruz 701 Ocean Street Santa Cruz, California 95060

SmartMeter Moratorium

Dear Members of the Board:

On December 13, 2011, your Board directed this office to return today with a report on issues associated with the current SmartMeter moratorium ordinance, and information on the possible extension of the moratorium for an additional year. Your Board also directed the Public Health Officer to return with an analysis of the research on the health effects of SmartMeters, and directed County Counsel to return with a report regarding the legality of a public utility refusing service to customers who are willing to pay for service and are willing to have an analog meter.

As your Board is aware, the California Public Utility Commission is considering PG&E's application for modification to PG&E's SmartMeter proposal to include an option for residential customers who do not wish to have a wireless SmartMeter. The item was scheduled on the January 12, 2012 agenda, but the commission anticipates that a vote on the proposal will not happen prior to February 1, 2012.

Moratorium Ordinance

Your Board has heard significant amounts of testimony regarding SmartMeters and concerns about their possible impact on health, questions about their accuracy, their inability to recover real-time data, privacy concerns, and the lack of safety standards for chronic long-term exposure to electromagnetic frequency radiation. In addition, PG&E has not presented studies to support their primary justification that the SmartMeter program will encourage customers to more effectively manage their utilization of electricity.

Given the broad concern about SmartMeter technology and your Board's desire to go on record, this office and County Counsel believe that notwithstanding the enforcement challenges, that it is in the best interest of public health, safety, and welfare for your Board to adopt the attached ordinance (Attachment A) implementing a temporary moratorium on the installation of SmartMeters in or on any home, apartment, condominium or business within the unincorporated area of the County. The purpose of the moratorium is to allow additional time to educate the CPUC about these concerns and allow time for adequate study of the impacts resulting from the SmartMeter technology.

SERVING THE COMMUNITY - WORKING FOR THE FUTURE

Ordinance Imposing Temporary Moratorium on Installation of SmartMeters Agenda: January 24, 20012

PG&E, asserting that local governments do not have jurisdiction on the installation of the meters, has ignored the previous Santa Cruz County ordinance as well as similar ordinances adopted in other jurisdictions. PG&E believes that only the California Public Utilities Commission (CPUC) has the authority to stop installation of the meters. Elected representatives, including the Board of Supervisors of Marin County, have acknowledged the limits of their ordinances to actually stop the installation of the meters. However, jurisdictions have adopted their ordinances with statements that such ordinances play an important role by informing the CPUC of significant community concerns.

Health Officer Report

The Public Health Officer's report is provided as Attachment B. The report discusses the health risks associated with SmartMeters, the scientific reports and actions the public might take to mitigate potential harm.

PG&E Shutoff Update

At the December 13, 2011, meeting, your Board questioned the PG&E representative about the utility company's decision to shut off power to the homes of residents who removed their SmartMeters. Subsequent to that meeting, PG&E restored power to those residences with the intent of charging them based on past electrical bills.

Petition

At your January 10, 2012 meeting, your Board was presented with a petition to the California Public Utilities Commission regarding PG&E SmartMeter Opt-out Application, (Petition A.11-03-014). The petition provides the opportunity for local elected officials to urge the Commission to continue Petition A.11-03-014 for further public hearings. The petition is provided as Attachment C. It is recommended that your Board direct the Chair to sign the petition on behalf of the Board and submit it to the PUC.

IT IS THEREFORE RECOMMENDED THAT YOUR BOARD:

- Direct the Chair to send a letter to the PUC calling for independent testing and monitoring of SmartMeters in place to determine duty cycles and frequency, especially in the following circumstances
 - Where both gas and electric meters are located closely together
 - Where there is a bank of SmartMeters such as on a multi-family residential building or apartment building
 - Where there is a collector meter on a home that serves the home, plus as many as 5000 other residential units in the area
 - Where a SmartMeter on a home acts as a relay for other local neighborhood meters

- (2) Direct the Chair to send a letter to the PUC and PG&E allowing any Santa Cruz County resident to request removal of a previously installed SmartMeter and the replacement with an analog meter
- (3) Accept and file the report from the Public Health Officer
- (4) Direct the Chair to sign the petition to the California Public Utilities Commission on behalf of the Board urging the Commission to delay consideration of a preliminary decision on PG&E's SmartMeter application until further public hearing and input are completed, and
- (5) Adopt the attached ordinance imposing a temporary moratorium on the installation of SmartMeters within the unincorporated area of Santa Cruz County and direct the Clerk of the Board to place the ordinance on the February 7, 2012 agenda for final consideration.

Very truly yours.

SUSAN A. MAURIELLO County Administrative Officer Attachments:

- A. Proposed Ordinance
- B. Report from Public Health Officer
- C. Petition to CPUC
- cc: PG&E California Public Utilities Commission

Attachment A

0252

ORDINANCE NO.

AN UNCODIFIED ORDINANCE OF THE COUNTY OF SANTA CRUZ IMPOSING A TEMPORARY MORATORIUM ON THE INSTALLATION OF SMARTMETERS AND RELATED EQUIPMENT IN, ALONG, ACROSS, UPON, UNDER AND OVER THE PUBLIC STREETS AND OTHER PLACES WITHIN THE UNINCORPORATED AREA OF SANTA CRUZ COUNTY

The Board of Supervisors of the County of Santa Cruz find as follows:

WHEREAS, the County of Santa Cruz (the "County"), through its police powers granted by Article XI of the California Constitution, retains broad discretion to legislate for public purposes and for the general welfare, including but not limited to matters of public health, safety and consumer protection; and

WHEREAS, the County of Santa Cruz has a franchise agreement with PG&E that has been in effect since 1955; and

WHEREAS, in addition, the County retains authority under Article XII, Section 8 of the Constitution to grant franchises for public utilities, and pursuant to California Public Utilities Code section 6203, "may in such a franchise impose such other and additional terms and conditions..., whether governmental or contractual in character, as in the judgment of the legislative body are to the public interest;" and

WHEREAS, Public Utilities Code section 2902 reserves the County's right to supervise and regulate public utilities in matters affecting the health, convenience and safety of the general public, "such as the use and repair of public streets by any public utility, the location of the poles, wires, mains, or conduits of any public utility, on, under, or above any public streets, and the speed of common carriers operating within the limits of the municipal corporation;" and

WHEREAS, Pacific Gas & Electric Company ("PG&E") is now installing SmartMeters in Central and Northern California and is installing these meters within the County of Santa Cruz; and

WHEREAS, concerns about the impact and accuracy of SmartMeters have been raised nationwide, leading the Maryland Public Service Commission to deny permission on June 21, 2010 for the deployment of SmartMeters in that state. The State of Hawaii Public Utility Commission also recently declined to adopt a smart grid system in that state. The CPUC currently has pending before it a petition from the City and County of San Francisco, and other municipalities, seeking to delay the implementation of SmartMeters until the questions about their accuracy can be evaluated; and

WHEREAS, major problems and deficiencies with SmartMeters in California have been brought to the attention of the Board of Supervisors of the County of Santa Cruz, including PG&E's confirmation that SmartMeters have provided incorrect readings costing ratepayers untold thousands of dollars in overcharges and PG&E's records outlined "risks" and "issues" including an ongoing inability to recover real-time data because of faulty hardware originating with PG&E vendors; and

WHEREAS, the ebb and flow of gas and electricity into homes discloses detailed information about private details of daily life. Energy usage data, measured moment by moment, allows the reconstruction of a household's activities: when people wake up, when they come home, when they go on vacation, and even when they take a hot bath. SmartMeters represent a new form of technology that relays detailed hitherto confidential information reflecting the times and amounts of the use of electrical power without adequately protecting that data from being accessed by unauthorized persons or entities and as such pose an unreasonable intrusion of utility customers' privacy rights and security interests. Indeed, the fact that the CPUC has not established safeguards for privacy in its regulatory approvals may violate the principles set forth by the U.S. Supreme Court in *Kyllo v. United States* (2001), 533 U.S. 27; and

WHEREAS, significant health questions have been raised concerning the increased electromagnetic frequency radiation (EMF) emitted by the wireless technology in SmartMeters, which will be in every house, apartment and business, thereby adding additional human-made EMF to our environment around the clock to the already existing EMF from utility poles, individual meters and telephone poles; and

WHEREAS, FCC safety standards do not exist for chronic long-term exposure to EMF or from multiple sources, and reported adverse health effects from electromagnetic pollution include sleep disorders, irritability, short term memory loss, headaches, anxiety, nausea, DNA breaks, abnormal cell growth, cancer, premature aging, etc. Because of untested technology, international scientists, environmental agencies, advocacy groups and doctors are calling for the use of caution in wireless technologies; and

WHEREAS, the primary justification given for the SmartMeters program is the assertion that it will encourage customers to move some of their electricity usage from daytime to evening hours; however, PG&E has conducted no actual pilot projects to determine whether this assumption is in fact correct. Nontransmitting time-of-day meters are already available for customers who desire

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them, and enhanced customer education is a viable non-technological alternative to encourage electricity use time shifting. Further, some engineers and energy conservation experts believe that the SmartMeters program--in totality--could well actually increase total electricity consumption and therefore the carbon footprint; and

WHEREAS, this Board of Supervisors sent a letter to the CPUC on September 15, 2010 expressing concern about reports that SmartMeter technology was interfering with the proper functioning of common household devices and requesting a response from the CPUC; and

WHEREAS, there has been no response by the CPUC to the letter sent by the Board of Supervisors; and

WHEREAS, because the potential risks to the health, safety and welfare of County residents are so great, the Board of Supervisors wishes to adopt a moratorium on the installation of SmartMeters and related equipment within the unincorporated area of the County of Santa Cruz. The moratorium period will allow the Council on Science and Technology and legislative process referenced above to be completed and for additional information to be collected and analyzed regarding potential problems with SmartMeters; and

WHEREAS, there is a current and immediate threat to public health, safety and welfare because, without this urgency ordinance, SmartMeters or supporting equipment will be installed or constructed or modified in the County without PG&E's complying with the CPUC process for consultation with the local jurisdiction, the County's Code requirements, and subjecting residents of Santa Cruz County to the privacy, security, health, accuracy and consumer fraud risks of the unproven SmartMeter technology; and

WHEREAS, the Board of Supervisors hereby finds that it can be seen with certainty that there is no possibility that the adoption and implementation of this Ordinance may have a significant effect on the environment. This Ordinance does not authorize construction or installation of any facilities and, in fact, imposes greater restrictions on such construction and installation in order to protect the public health, safety and general welfare. This Ordinance is therefore exempt from the environmental review requirements of the California Environmental Quality Act (CEQA) pursuant to Section 15061(b)(3) of Title 14 of the California Code of Regulations; and

WHEREAS, there is no feasible alternative to satisfactorily study the potential impact identified above as well or better with a less burdensome or restrictive effect than the adoption of this interim urgency moratorium ordinance; and

WHEREAS, based on the foregoing it is in the best interest of public health, safety and welfare to allow adequate study of the impacts resulting from the SmartMeter technology; therefore it is appropriate to adopt a temporary moratorium that would remain in effect from the date of its adoption until December 31, 2012, unless your Board acts to repeal it prior to that date.

NOW, THEREFORE BE IT ORDAINED by the Board of Supervisors of the County of Santa Cruz as follows:

SECTION I

Moratorium. From and after the effective date of this Ordinance, no SmartMeter may be installed in or on any home, apartment, condominium or business of any type within the unincorporated area of the County of Santa Cruz, and no equipment related to SmartMeters may be installed in, on, under, or above any public street or public right of way within the unincorporated area of the County of Santa Cruz.

SECTION II

Violations of the Moratorium may be charged as infractions or misdemeanors as set forth in Chapter 1.12 of the Santa Cruz County Code. In addition, violations may be deemed public nuisances, with enforcement by injunction or any other remedy authorized by law.

SECTION III

This Board of Supervisors finds and determines that: (a) there is a current and immediate threat to the public peace, health, or safety; (b) the moratorium must be imposed in order to protect and preserve the public interest, health, safety, comfort and convenience and to preserve the public welfare; and (c) it is necessary to preserve the public health and safety of all residents or landowners adjacent to such uses as are affected by this interim ordinance as well as to protect all of the citizens of Santa Cruz County by preserving and improving the aesthetic and economic conditions of the County.

SECTION IV

If any provision of this interim ordinance is held to be unconstitutional, it is the intent of the Board of Supervisors that such portions of such ordinance are severable from the remainder and the remainder is given full force and effect.



41

SECTION V

This interim ordinance is not subject to the California Environmental Quality Act (CEQA) pursuant to Section 15060(c) (2) – the activity will not result in a direct or reasonably foreseeable indirect physical change in the environment and Section 15060(c) (3) – the activity is not a project as defined in Section 15378 of the CEQA Guidelines, because it has no potential for resulting in physical change to the environment, directly or indirectly.

SECTION VI

This ordinance shall take effect on the 31st day after the date of final passage.

PASSED AND ADOPTED THIS ____ day of _____, 2012, by the Board of Supervisors of the County of Santa Cruz by the following vote:

AYES:	SUPERVISORS
NOES:	SUPERVISORS
ABSENT:	SUPERVISORS
ABSTAIN:	SUPERVISORS

Chairperson of the Board of Supervisors

Attest:

Clerk of the Board

APPROVED AS TO FORM:

County Counse



Attachment B



County of Santa Cruz 0257

HEALTH SERVICES AGENCY

POST OFFICE BOX 962, 1060 EMELINE AVE., SANTA CRUZ, CA 95061-0962 TELEPHONE: (831) 454-4114 FAX: (831) 454-5049 TDD: (831) 454-4123

Poki Stewart Namkung, M.D., M.P.H. Health Officer Public Health Division

Memorandum

Date: January 13, 2012

To: Santa Cruz County Board of Supervisors

From: Poki Stewart Namkung, M.D., M.P.H. POW Health Officer

Subject: Health Risks Associated With SmartMeters

<u>Overview</u>

On December 13, 2011, Santa Cruz County Board of Supervisors directed the Public Health Officer to return on January 24, 2012, with an analysis of the research on the health effects of SmartMeters.

Background

In order to analyze the potential health risks associated with SmartMeters, the following questions should be asked:

- 1) What is the SmartMeter system and what is the potential radiation exposure from the system?
- 2) What scientific evidence exists about the potential health risks associated with SmartMeters?
- 3) Are there actions that the public might take to mitigate any potential harm from SmartMeters?

SmartMeters are a new type of electrical meter that will measure consumer energy usage and send the information back to the utility by a wireless signal in the form of pulsed frequencies within the 800 MHz to 2400MHz range, contained in the microwave portion of the electromagnetic spectrum. SmartMeters are considered part of 'smart grid' technology that includes: a) a mesh network or series of pole-mounted wireless antennas at the neighborhood level to collect and transmit wireless information from all SmartMeters in that area back to the utility; b) collector meters, which are a special type of SmartMeter that collects the radiofrequency or microwave radiation signals from many surrounding Health Risks Associated With SmartMeters Agenda: January 24, 2012 Page 2 of 8

Attachment B

buildings (500-5000 homes or buildings) and sends the information back to the utility; and c) proposed for the future, a power transmitter to measure the energy use of individual appliances (e.g. washing machines, clothes dryers, dishwasher, etc) and send information via wireless radio frequency signal back to the SmartMeter. The primary rationale for SmartMeters and grid networks is to more accurately monitor and direct energy usage.

The public health issue of concern in regard to SmartMeters is the involuntary exposure of individuals and households to electromagnetic field (EMF) radiation. EMFs are everywhere, coming from both natural and man-made sources. The three broad classes of EMF are:

- extremely low frequency, ELF (from the sun or powerlines)
- radio frequency, RF (from communication devices, wireless devices, and SmartMeters)
- extremely high frequency, known as ionizing radiation (x-rays and gamma rays)

Much of this exposure is beyond our control and is a matter of personal choice; however, public exposure to RF fields is growing exponentially due to the proliferation of cell phones, and wireless fidelity (Wi-Fi) technology. To understand the relationship between EMF from SmartMeters and other sources, it is helpful to view the electromagnetic spectrum:

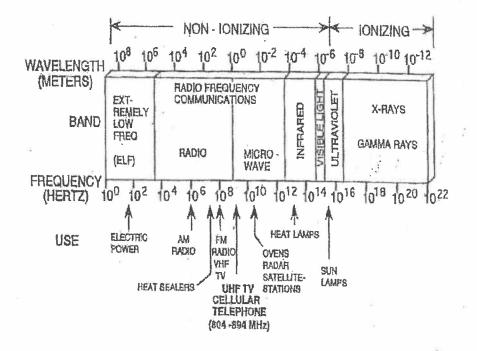


Fig. 1: The electromagnetic spectrum, showing the relation s between ELF and RF fields, wavelength and frequency, and the ionizing and non-ionizing portions of the spectrum.

The Federal Communications Commission (FCC) has adopted limits for Maximum Permissable Exposure (MPE) that are based on exposure guidelines published by the National Council on Radiation Protection and Measurements (NCRP). The limits vary with

Health Risks Associated With SmartMeters Agenda: January 24, 2012 Page 3 of 8

0259

the frequency of the electromagnetic radiation and are expressed in units of microwatts per centimeter squared. A SmartMeter contains two antennas whose combined timeaveraged public safety limit of exposure is 655µW/cm² (Sage, 2011). According to the California Council on Science and Technology (CCST) Report (2011), within distances of three to ten feet, SmartMeters would not exceed this limit. However, CCST did not account for the frequency of transmissions, reflection factors, banks of SmartMeters firing simultaneously, and distances closer than three feet. There are numerous situations in which the distance between the SmartMeters and humans is less than three feet on an ongoing basis, e.g. a SmartMeter mounted on the external wall to a bedroom with the bed placed adjacent to that mounting next to the internal wall. That distance is estimated to be one foot. The CCST Report also states that SmartMeters will generally transmit data once every four hours, and once the grid is fully functional, may transmit "more frequently." It has been aptly demonstrated by computer modeling and real measurement of existing meters that SmartMeters emit frequencies almost continuously, day and night, seven days a week. Furthermore, it is not possible to program them to not operate at 100% of a duty cycle (continuously) and therefore it should not be possible to state that SmartMeters do not exceed the time-averaged exposure limit. Additionally, exposure is additive and consumers may have already increased their exposures to radiofrequency radiation in the home through the voluntary use of wireless devices such as cell and cordless phones. personal digital assistants (PDAs), routers for internet access, home security systems. wireless baby surveillance (baby monitors) and other emerging devices. It would be impossible to know how close a consumer might be to their limit, making safety a uncertainty with the installation of a mandatory SmartMeter.

This report will focus on the documented health risks of EMF in general, the relevance of that data to SmartMeters exposure, the established guidelines for RF safety to the public at large, and then provide recommendations to ameliorate the risk to the public's health.

Evidence-based Health Risks of EMFs

There is no scientific literature on the health risks of SmartMeters in particular as they are a new technology. However, there is a large body of research on the health risks of EMFs. Much of the data is concentrated on cell phone usage and as SmartMeters occupy the same energy spectrum as cell phones and depending on conditions, can exceed the whole body radiation exposure of cell phones phones (see Attachment B1, Figure 4). In terms of health risks, the causal factor under study is RF radiation whether it be from cell phones, Wi-Fi routers, cordless phones, or SmartMeters. Therefore all available, peer-reviewed, scientific research data can be extrapolated to apply to SmartMeters, taking into consideration the magnitude and the intensity of the exposure.

Since the mid-1990's the use of cellular and wireless devices has increased exponentially exposing the public to massively increased levels of RF. There is however, debate regarding the health risks posed to the public given these increased levels of radiation. It must be noted that there is little basic science funding for this type of research and it is largely funded by industry. An intriguing divide, noted by Genuis, 2011 is that most

Health Risks Associated With SmartMeters Agenda: January 24, 2012 Page 4 of 8

0260

research carried out by independent non-government or non-industry affiliated researchers suggests potentially serious effects from many non-ionizing radiation exposures; most research carried out by independent non-government or non-industry affiliated researchers suggests potentially serious effects from many non-ionizing radiation exposures research funded by industry and some governments seems to cast doubt on the potential for harm. Elements of the controversy stem from inability to replicate findings consistently in laboratory animal studies. However, analysis of many of the conflicting studies is not valid as the methodology used is not comparable. Despite this controversy, evidence is accumulating on the results of exposure to RF at non-thermal levels including increased permeability of the blood-brain barrier in the head (Eberhardt, 2008), harmful effects on sperm, double strand breaks in DNA which could lead to cancer genesis (Phillips, 2011), stress gene activation indicating an exposure to a toxin (Blank, 2011), and alterations in brain glucose metabolism (Volkow, 2011).

In terms of meta-analyzed epidemiological studies, all case–control epidemiological studies covering >10 years of cell phone use have reported an increased risk of brain tumors from the use of mobile phones (Hallberg, 2011). Other studies have pointed to an increasing risk of acoustic neuroma, salivary gland tumors, and eye cancer after several years of cell phone use and the tumors occur predominantly on the same side of the head as the phone is used. The analysis of brain cancer statistics since the mid 20th century in several countries reveals that brain tumor formation has a long latency time, an average of over 30 years to develop from initial damage.(Hallberg, 2011). Therefore using studies such as the Interphone Study which looked as shorter latency periods for the development of specific brain cancers will result in inconclusive data.

Another potential health risk related to EMF exposure, whose legitimacy as a phenomen remains contentious, is electromagnetic hypersensitivity (EHS). In the 1950's, various centers in Eastern Europe began to describe and treat thousands of workers, generally employed in jobs involving microwave transmission. The afflicted individuals often presented with symptoms such as headaches, weakness, sleep disturbance, emotional instability, dizziness, memory impairment, fatigue, and heart palpitations. Clinical research to verify the physiological nature of this condition did not begin in earnest until the 1990's and found that the EMF involved was usually within the non-ionizing range of the electromagnetic spectrum. In the early 2000's, estimates of the occurrence of EHS began to swell with studies estimating the prevalence of this condition to be about 1.5% of the population of Sweden (Hilleert et al., 2002), 3.2% in California (Levallios et al., 2002), and 8% in Germany (infas Institut fur angewandte Sozialwissenschaft GmbH, 2003).

In 2004, WHO declared EHS "a phenomenon where individuals experience adverse health effect while using or being in the vicinity of devices emanating electric, magnetic, or electromagnetic fields (EMFs)...Whatever its cause, EHS is a real and sometimes debilitating problem for the affected persons (Mild et al., 2004)."

Currently, research has demonstrated objective evidence to support the EHS diagnosis, defining pathophysiological mechanisms including immune dysregulation in vitro, with

Attachment B

Health Risks Associated With SmartMeters Agenda: January 24, 2012 Page 5 of 8

0261

increased production of selected cytokines and disruption and dysregulation of catecholamine physiology (Genuis, 2011).

Until recently, the diagnosis of EHS has not received much support from the medical community due to lack of objective evidence. In an effort to determine the legitimacy of EHS as a neurological disorder, however, a collection of scientists and physicians recently conducted a double-blinded research study that concluded that "EMF hypersensitivity can occur as a bona fide environmentally-inducible neurological syndrome (McCarty et al., 2011).

Safety Guidelines

The guidelines currently used by the FCC were adopted in 1996, are thermally based, and are believed to protect against injury that may be caused by acute exposures that result in tissue heating or electric shock. FCC guidelines have a much lower certainty of safety than standards. Meeting the current FCC guidelines only assures that one should not have heat damage from SmartMeter exposure. It says nothing about safety from the risk of many chronic diseases that the public is most concerned about such as cancer, miscarriage, birth defects, semen quality, autoimmune diseases, etc. Therefore, when it comes to nonthermal effects of RF, FCC guidelines are irrelevant and cannot be used for any claims of SmartMeter safety unless heat damage is involved (Li, 2011).

There are no current, relevant public safety standards for pulsed RF involving chronic exposure of the public, nor of sensitive populations, nor of people with metal and medical implants that can be affected both by localized heating and by electromagnetic interference (EMI) for medical wireless implanted devices. Many other countries (9) have significantly lower RF/MW exposure standards ranging from 0.001 to 50 μ W/cm² as compared with the US guideline of 200-1000 μ W/cm². Note that these recommended levels are considerably lower that the approximately 600 μ W/cm². (time-averaged) allowed for the RFR from SmartMeters operating in the low 900 MHz band mandated by the FCC based on only thermal consideration.

In summary, there is no scientific data to determine if there is a safe RF exposure level regarding its non-thermal effects. The question for governmental agencies is that given the uncertainty of safety, the evidence of existing and potential harm, should we err on the side of safety and take the precautionary avoidance measures? The two unique features of SmartMeter exposure are: 1) universal exposure thus far because of mandatory installation ensuring that virtually every household is exposed; 2) involuntary exposure whether one has a SmartMeter on their home or not due to the already ubiquitous saturation of installation in Santa Cruz County. Governmental agencies for protecting public health and safety should be much more vigilant towards involuntary environmental exposures because governmental agencies are the only defense against such involuntary exposure to electromagnetic radiation can be found in Attachment B2.

0262

References:

Balmori, A. "Electromagnetic Pollution from Phone Masts. Effects of Wildlife." <u>Pathophysiology</u> (2009).

Blackman, C. "Cell Phone Radiation: Evidence from ELF and RF studies supporting more inclusive risk identifiation assessment,." <u>Pathophysiology</u> (2009): doi: 10.1016.

-. "Cell Phone Radiation: Evidence from ELF and RF Studies Supporting More Inclusive Risk Identification Assessment." <u>Pathophysiology</u> (2009).

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Attachment B

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Attachment B1

Figure 4 from Hirsch; 2011

40 40 40 35 30 25 20 15 10 0.75 2 5 0.75 0.5 0 Cell Phone Made Body Maximum Microwave Oven 2 Feet Snartheer 3 Feet Aways On 0.005 Snathleter Dreet Aways on Minimum with Router 3 reet Em Radio IV Broadcast

Figure 4. Comparison of Radio-Frequency Levels to the Whole Body from Various Sources in μ W/cm² over time [corrected for assumed duty cycle and whole body exposure extrapolated fro m EPRI/CCST SmartMeter estimated levels at 3 feet].

0265

0266

Attachment B2

Examples of strategies to reduce electromagnetic radiation.

(Genuis SJ, 2011)

Sources of adverse EMR	Considerations to reduce EMR exposure	
Cell phones and cordless phones	 Minimize use of cell and cordless phones and <i>use</i> speaker phones when possible Leave cell or cordless phone away from 	
Wireless internet	 the body rather than in pocket or attached at the hip. Use wired internet Turn off the internet router when not in use (e.g. night-time) Use power line network kits to achieve internet access by using existing wiring and avoiding wireless emissions. 	
Computers releasing high EMR	 Limit the amount of time spent working on a computer Avoid setting a laptop computer on the lap Increase the distance from the transformer. 	
Handheld electronics (electric toothbrush, hair dryer, Smart phone, electronic tablets, etc.)	 Stay a reasonable distance away from the computer Limit the use of electronics and/or revert to using power-free devices Turn devices off before going to sleep Minimize electronics in bedrooms 	
Fluorescent lights	 Consider using alternate lighting such as incandescent (Uncertainty exists about the safety of LED lights) Rely on natural sunlight for reading 	
Household power	 Measure levels of EMR and modify exposures as possible Avoid sleeping near sites of elevated EMR Filters can be used to mitigate dirty power 	
High voltage power lines substations, transmission towers, and emitters (cell phone tower, radar, etc.)	 Consider relocating to an area not in close proximity to high voltage power lines Maintain considerable distance from emitters Consider forms of shielding (shielding paints; grounded metal sheets) 	
Utility neutral-to-ground bonded to water pipes	• Increase size of neutral-wire to substation and install dielectric coupling in water pipe.	

Petition to the California Public Utilities Commission Re: PG&E SmartMeter Opt-out Application, A.11-03-014

We the undersigned elected officials urge the Commission to delay consideration of President Peevey's preliminary decision until further public hearing and input are completed. The decision, which calls for charging fees to customers who elect to opt out of the SmartMeter program, conflicts with local planning authority, does not protect the health or safety of all residents and imposes a prejudicial financial burden on ratepayers who chose to opt out of the program. We therefore urge the Commission to continue consideration of this matter until further public hearings are completed to ensure the due process rights of all stakeholders.

The order does not provide an empirical basis for the amount of the fees to be charged to opt out customers nor does it consider the net financial impact of PG&E's latest proposal to permit customer retention of analogue meters. Hence the order effectively eliminates a full and fair hearing process for these contested issues of fact to be considered and resolved.

Historically, telecommunications carriers throughout this state have complied with local planning codes which provide notice to residents as to the construction of transmission facilities. Pacific Gas and Electric Company ignored such codes in the deployment of the Smart Meter telecommunications network. Currently many of our jurisdictions have passed ordinances which impose a moratorium on wireless SmartMeters and have petitioned to opt out on a jurisdictional basis. The current order is silent on these issues and effectively discards them without consideration.

The decision also ignores the longstanding controversy and concern about the health impacts associated with electro-magnetic fields. A 1998 California Department of Health Services study commissioned by the California Public Utility Commission itself found that 3.2% of Californians reported hypersensitivity to electro-magnetic fields. A May 2011 study released by the World Health Organization/International Agency for Research on Cancer reclassified RF radiation of the type emitted by wireless equipment throughout the Smart Meter system as "possibly carcinogenic" to humans. President Peevey's order effectively imposes a different rate on many utility customers who need to avoid exposure in violation of California Public Utilities Code section 453(b) which states in pertinent part that "No public utility shall prejudice, disadvantage, or require different rates or deposit amounts from a person because of ancestry, medical condition, marital status or change in marital status, occupation..."

President Peevey's decision does not address these concerns nor does it the financial viability of wired equipment alternatives. In so doing, it eliminates a much anticipated public hearing process.

 Signature
 Jurisdiction

 Signature
 Jurisdiction

For all of the foregoing reasons, we respectfully urge the Commission to continue Petition A.11-03-014 matter for further hearings.

41

Maureen McCarty

From: Sent: To: Subject: Mark Stone [BDS050@co.santa-cruz.ca.us] Monday, January 09, 2012 1:30 PM Maureen McCarty FW: smart meter opt-out letter and moratorium on smart meters

From: theodora kerry[<u>SMTP:THEKERRY@COMCAST.NET</u>] Sent: Monday, January 09, 2012 1:30:14 PM To: Mark Stone Subject: re: smart meter opt-out letter and moratorium on smart meters Auto forwarded by a Rule

This letter is directed to the whole Board of Supervisors, and, as such, should be included in the public record.

Dear Chairperson Stone,

Having attended the board meeting on Dec. 13, and witnessed the Board's active interrogation of the P.G.&E. rep's woeful defense of her employer's shutting off of electricity to customers who dared to protect their health and that of their children by removing their smart meters, I'm very disappointed to read the agenda for tomorrow's meeting only to find that the expected follow-through re: smart meters was no where to be found. While you did approve a letter to the CPUC expressing your opposition to opt-out charges, many of us need you to go further and protect our right to analog meters, as many health problems have been linked to smart meters that have their wireless component turned off. Despite PG&E's crying "public safety concerns", the analog meters have proven to be safe for decades, unlike the recently installed smart meters which have already been linked to health problems, fires, and overcharging. Unfortunately, the CPUC is supposed to decide this issue as early as Jan.12, leaving you no time to write a stronger letter to the CPUC given that the issue is not on the agenda. While I applaud the strong stance you took with the PG&E's rep at the last meeting, that in itself does little to protect us, your constituents. Even the smart meter moratorium as been little more than window dressing as the Sheriff continues to use his power to protect PG&E contractors, instead of the local citizenry. I reiterate my call for you, the Board of Supervisors, to use your power of the purse strings to make it clear to the Sheriff that he is expected to support the moratorium/citizens, not the profileering corporations.

Regardless of what you eventually decide, you, like the rest of us, are equally at the mercy of these meters. What you allow to be done unto us by PG&E is also being done unto you.

Theodora Kerry Santa Cruz, CA 95060

41

Neal Coonerty

From: Sent: To: Subject: Angela Flynn [angelaflynn80@msn.com] Wednesday, January 18, 2012 11:49 AM Neal Coonerty Submitted material for upcoming agenda item on SmartMeters for 1/24/12 Board of Supervisors meeting

Please include this material with the agenda item related to SmartMeters on the January 24th meeting.

Submitted by:

Angela Flynn 351 Redwood Heights Road Aptos, CA 95003 831-684-1401 angelaflynn80@msn.com

1. "Smart Meters - Smarter Practices" by Dr. Jamieson (commissioned by the UK EM Radiation Research Trust), comprises 265 pages of research & current knowledge of health & environmental effects from the smart meters. This work is a highly recommended read and can be downloaded (for free) on:

Part 1 of the book "Smart Meters - Smarter Practices": http://www.electromagneticman.co.uk/images/stories/downloads/051211 SM Brussels pt 1 v3.pdf

Part 2 of the book "Smart Meters - Smarter Practices": <u>http://www.electromagneticman.co.uk/images/stories/downloads/051211_SM_Brussels_pt_2_v4.pdf</u>

2. ICEMS Monograph: "Non-Thermal Effects and Mechanisms of Interaction Between Electromagnetic Fields and Living Matter" 23.11.2010 by emily Category Electromagnetic Health Blog

"Non-Thermal Effects and Mechanisms of Interaction Between Electromagnetic Fields and Living Matter", a monograph edited by Livio Giuliani and Morando Soffritti for the "European Journal of Oncology" – Library Vol. 5 of the National

Institute for the Study and Control of Cancer and Environmental Diseases "Bernardo Ramazzini", Bologna, Italy, 2010, Part I and Part II.

Download Part I http://electromagnetichealth.org/wp-content/uploads/2010/11/ramazzini library5 part1.pdf

Download Part II http://electromagnetichealth.org/wp-content/uploads/2010/11/ramazzini library5 part2.pdf

3. Electromagnetic intolerance elucidated

http://www.emfacts.com/2012/01/electromagnetic-intolerance-elucidated/

By André Fauteux, Editor

(Translated from La Maison du 21e siècle magazine, Quebec (Canada), January 2011) <u>http://21esiecle.qc.ca/lintolérance-électromagnétique-élucidée</u>

In 2002, World Health Organization (WHO) Director General Gro Harlem Brundtland told journalists that microwaves emitted by cellphones made her sick, even if the phone only turned on and hidden in a pocket or purse located up to four meters away. Nonetheless, the World Health Organization stated in 2005 that electrosensitivity symptoms may be of psychosomatic origin, a claim French oncologist Dominique Belpomme says is refuted recent discoveries.

#41

French researchers recently demonstrated that electromagnetic fields (EMFs) substantially alter the physiology of the blood and brain of electrosensitive people and that the impact on these biological markers increases and decreases according to the intensity of EMF exposure.

"We know with certainty that electromagnetic hypersensitivity is not psychosomatic", Dr Dominique Belpomme stated in a [November 2010] telephone interview. "EMFs provoke major effects in the brain. The most important of these is the opening of the blood-brain barrier. This allows mercury, organochlorines and other pollutants to enter in the brain, where they cause various neurodegenerative diseases."

20 new patients per week

A professor of oncology at Paris-Descartes University, Dr. Belpomme is President of the French Association for Research in Therapeutics Against Cancer (www.artac.info), which has shifted in the prevention from 2004. Since May 2008, his team has studied what he coined the Electromagnetic Intolerance Syndrome (SICEM in French). "I have 450 patients and see up to 20 new cases every week, including children who have headaches, impaired memory, concentration or language. We have the largest European cohort of electrosensitive patients. This is a major public health concern."

The SICEM is an extreme reaction to low-level exposure to 50/60 Hz electric and magnetic fields emitted by electrical cables and devices as well as radio frequencies (10 MHz to 300 GHz including microwave) from wireless devices and antennas.

"In Sweden, electrohypersensitivity (EHS) is an officially fully recognized functional impairment (i.e., it is not regarded as a disease, thus no diagnosis exists), explains Swedish dermatologist and EHS expert Olle Johannson. <u>http://iopscience.iop.org/1755-1315/10/1/012005</u> Thus, the first step for a person in Sweden with a functional impairment is to contact the municipality's special civil servant for disability issues, as well as the various handicap organizations and authorities, to achieve accessibility measures of various types with the sole aim to have an equal life in a society based on equality according to the The UN Convention on Human Rights for Persons with Functional Impairments, <u>www.un.org</u>."

People with EHS are often incorrectly referred in psychiatry while many experts such as Belpomme say the first treatment they require is reducing or eliminating their exposure to EMFS. Their symptoms (neurological, cardiovascular, dermatological, muscular, etc.) are sometimes so serious that they must shield themselves with special clothing, curtains as well as grounded paints and vapor barriers. Others move into forests, caves or other remote locations if they are unable to find a low-EMF environment where their symptoms can recede or disappear.

Dr. Belpomme's team has developed a diagnostic method based on blood tests and a special brain scan (pulsed Doppler echography) to visualize blood flow. "These patients clearly have vascular disorders in the brain, said the oncologist. In addition, our biological tests show that 30% of them have high levels of histamine, 50% have too much stress proteins, most have low levels of melatonin (an potent anti-cancer hormone), and 30% have levels of antibodies and proteins that are tell-tale signs of thermal shock and brain damage." He adds that half of his patients suffer from Multiple Chemical Sensitivity (MCS) and that MCS and EHS share the same brain abnormalities.

The oncologist explained that there are three distinct levels of sensitivity to pollutants. First, there is intolerance, caused by polymorphism. "This means that we are all different. For example, 30% of the population is most at risk of developing cancer." Second, there is the susceptibility factor demonstrated by Swedish oncologist Lennart Hardell who studied 16 families who were electrosensitive because of shared genetic factors. There are also active susceptibility factors, "such as dental amalgam that behave like antennas capturing airwaves", explains Belpomme.

Finally, electromagnetic hypersensitivity appears in two stages. "The first phase is induced by exposure to a specific EMF frequency, either an acute or chronic exposure, such as talking on a cell phone 20 minutes every day. The first signs of hypersensitivity are pain and a heat sensation in the ear. In the second phase, the disease sets in. That's when you become intolerant at all frequencies." **Experienced researchers**

ARTAC's scientific council is chaired by virologist Luc Montagnier, 2008 co-recipient of the Nobel Prize in medicine as codiscoverer of the Human Immunodeficiency Virus (HIV) believed to cause AIDS. And its research coordinator is doctor of nutrition Philippe Irigaray, one of five international experts recently appointed by Quebec's Health Research Fund to select the most promising research projects in environmental cancer prevention. Dr Irigaray stresses that the human brain contains magnetosomes, iron oxides that behave like magnets. Electrosensitivity may depend on their quantity, which varies from one individual to another. ARTAC researchers are currently preparing five scientific papers on electrosensitivity. "It takes a lot of time, said Dr Belpomme.

They will published in a year or two. But action is needed immediately to reduce people's overexposure to EMFs."

In France, an estimated 5% of the population is already electrosensitive, and the proportion is constantly increasing with the evergrowing popularity of wireless technologies. "Studies show that 10 to 50% of the population may become very intolerant to EMFs over the next 25 to 50 years, Dr Belpomme said. I have two cases of multiple sclerosis triggered after prolonged use of a cell phone, three cases of breast cancer – two recurrences after exposure to EMFs and one case related to the use of computers – and anecdotal evidence also for autism and Alzheimer's disease whose risk is much higher than for cancer. Causal links with electromagnetic fields are highly possible."

Dr Belpomme said he has relieved some EHS patients by administering medication to tone-up the nervous system and antihistamines to close the blood-brain barrier.

No causal link, says WHO

In 2005, the World Health Organization published Fact Sheet No 296 entitled Electromagnetic hypersensitivity <u>http://www.who.int/mediacentre/factsheets/fs296/en/index.html</u> It stated : "Well controlled and conducted double-blind studies have shown that symptoms were not correlated with EMF exposure... The symptoms are certainly real and can vary widely in their severity... Further, EHS is not a medical diagnosis, nor is it clear that it represents a single medical problem.

Physicians: Treatment of affected individuals should focus on the health symptoms and the clinical picture, and not on the person's perceived need for reducing or eliminating EMF in the workplace or home. This requires:

• a medical evaluation to identify and treat any specific conditions that may be responsible for the symptoms,

• a psychological evaluation to identify alternative psychiatric/psychological conditions that may be responsible for the symptoms,

• an assessment of the workplace and home for factors that might contribute to the presented symptoms. These could include indoor air pollution, excessive noise, poor lighting (flickering light) or ergonomic factors. A reduction of stress and other improvements in the work situation might be appropriate."

Bull, said Dr. Dominique Belpomme. "This setback is of a political nature that has nothing to do with science. WHO will be forced to revise its decision in the coming months. It is a societal denial that does not take account of current knowledge which is constantly evolving. "[read Microwave News's coverage of conflicts of interest at WHO] <u>http://www.microwavenews.com/CT.html</u> The oncologist argues the causal link between exposure to magnetic fields and leukemia is no longer in doubt. "When we increase the dose, it increases the rate of leukemia. Dozens of laboratory toxicological studies have demonstrated this most clearly, in vitro as well as in animals."

For her part, Ontario researcher Magda Havas of Trent University <u>http://www.magdahavas.com/</u> said EHS studies with negative results have major biases. "The researchers assumed that reactions to EMFs are immediate, while there is often a delay between exposure and response. People are not switches that can be turned on and off. These studies incorrectly insinuate that if you can not feel anything, it can't harm you. We know very well that we can't detect the taste of arsenic, lead, DDT nor asbestos, but they are all toxic."

Further reading:

Research Studies into Electrical Sensitivity

http://www.es-uk.info/info/research.asp

Radiofrequency/Microwave Radiation and the International Agency for Research on Cancer (IARC)

www.powerwatch.org.uk/pdfs/20110520-iarc-maisch.pdf

The problem of conflict of interest & commercial influence in WHO agencies and the need for public interest representation http://www.scribd.com/doc/57404194/The-problem-of-conflict-of-interest-commercial-influence-in-WHO-agencies-and-the-need-for-

public-interest-representation-Iarc-May-5

Petition to the World Health Organization to remove Dr. Mike Repacholi immediately from his position as General Coordinator "International Electromagnetic Fields Project"

http://www.omega-news.info/petition_to_the_w.h.o._remove_dr._mike_repacholi.htm

Mystery in the skin : Screen dermatitis, the effect of computeur work on human skin. (Interview with Dr Olle Johansson) http://www.feb.se/ARTICLES/OlleJ.html

André Fauteux, Publisher/Editor La Maison du 21e siècle magazine 2955 Domaine-lac-Lucerne Ste-Adèle (Qc) Canada J8B 3K9 450 228-1555 <u>info@21esiecle.qc.ca</u> www.21esiecle.qc.ca Read the full story here <u>http://www.emfacts.com/2012/01/electromagnetic-intolerance-elucidated/</u>



"Smart" Meters



"Many of them said they had never heard of electrical sensitivities before, were developing strange symptoms they never had before, could not use computers, wi-fi or cell phones any more without painful symptoms (even though previously they had been using them heavily with wi-fi in offices and on in homes 24/7). Weeks or months after their symptoms began they first discovered a smart meter on their home. Upon inquiry, they found out it had been installed at the time or just before their symptoms initiated... All this was surprising to me because this device was initiating ES (electrosensitivity) in previously normal, healthy persons who had tolerated wi-fi and cell phones for years with no problems." **Richard H. Conrad, Ph.D.,** John Hopkins trained biochemist, Pre-Filed **Testimony** to the Maine Public Utilities Commission regarding Smart Meter Opt out Program, Feb 1, 2013

"Smart" Meters for a "Smart" Grid

Utilities in all states have been replacing decades old but still perfectly functioning analogue meters with so-called Smart Meters on peoples homes for the purpose of wirelessly reading electricity use by sending radio frequency signals to neighboring houses which then are sent to local nodes and then to the local utility. This creates a continuous "Smart Grid" blanket of electromagnetic radiation in neighborhoods for the purpose of efficient wireless transfer of household data on energy use to the main utility carrier for billing and data analysis. The human meter readers are no longer needed to read the meters directly. Although convenient for utilities there have been a host of problems reported from privacy and security to serious health effects and fires. Many residents have organized nationwide to educate others about these risks and pass legislation to allow residents to Opt Out of Smart Meters.

Convenience or Hazard?

Smart Meter placement seems to be a wonderful convenience, however, these meters use 2.4 GHz microwave (and 900 MHz) radiation for communications which is what our microwave ovens, Wi-Fi routers and other wireless devices use. The Smart Meters are also on 24/7. Although consultants average the electromagnetic radiation emitted, they do not take into account research showing that pulsed radio frequency radiation is harmful even at lower power. It is the spikes of pulsed energy and not the average power density that causes the harm to cellular structures. In addition the long term cumulative exposures have been found to be harmful and are not taken into consideration in the rollout of these devices . Smart Meters can pulse up to 190,000 times a day. The 2.4 GHz wireless technology frequencies pulse at 2.4 billion cycles per second. We evolved in the earth's natural low magnetic field resonance of 7.83 Hz (7.83 cycles per second) and are now exposed in almost every environment- home, work, school and businesses-to continuous mix of manmade microwave frequencies.

Smart Meters and "Dirty Electricity"

Smart Meters placed on homes appear to have a particularly devastating effect on health as this pulsed non-ionizing radiation is transmitted through household wiring, creating widespread local fields of what is termed dirty electricity **(Dirty electricity EMF Analysis) A**lthough aiming to connect wirelessly to our appliances and Internet of Things Appliances that are now being sold, this disharmonic mix of frequencies from both wired and wireless sources can affect our biological functioning. This is despite the fact that these levels are well below the **ICNIRP Guidelines** that are considered "safe". Sienkiewicz et al notes that with regards to research in this field, "there is a crucial difference between epidemiology studies and laboratory work in terms of signals investigated: most people are exposed to a complex mixture of frequencies and signals at varying intensities, whereas the majority of animal studies have been performed using a single frequency or intensity." **Are Exposures to Multiple Frequencies the Key to Future Radiofrequency Research?**

• For an engaging, concise and helpful explanation see also **Electrical Pollution in Your Home. Alison Main. Nov 2017.**

Research on Smart Meters

Although there is a growing body of peer reviewed evidence that wireless non-ionizing microwave electromagnetic radiation is harmful to all living organisms at high and low exposures and to all organ systems there is virtually no research on Smart Meters themselves. **Dr Lamech**, however, examined a government survey in Victoria, Australia looking at symptoms development after smart meters were installed. One would expect adverse symptoms similar to electrosensitvity and this was confirmed by Frederica Lamech (2014).

She writes, "In 2006, the government in the state of Victoria, Australia, mandated the rollout of smart meters in Victoria, which effectively removed a whole population's ability to avoid exposure to human-made high-frequency nonionizing radiation. This issue appears to constitute an unprecedented public health challenge for Victoria. By August 2013, 142 people had reported adverse health effects from wireless smart meters by submitting information on an Australian public Web site using its health and legal registers."

After removing any ineligible participants without confirmed address, she took a survey of symptoms reported after the smart meters were placed. She found host of adverse physical health symptoms. These symptoms had a negative effect on these peoples lives in terms of normal functioning. Notably only 8% of the 92 final group reported they had electrosensitivity prior to the installation of smart meters, which Dr. Lamech states, "... points to the possibility that smart meters may have unique characteristics that lower people's threshold for symptom development." The most common reported symptoms were:

- insomnia
- headaches

- tinnitus
- fatigue
- cognitive disturbances
- dysesthesias (abnormal sensation)
- dizziness

Dr. Lamech Research

Self-reporting of symptom development from exposure to radiofrequency fields of wireless smart meters in Victoria, Australia: A case series. Self Reporting of symptom development from exposure to radio frequency fields of wireless smart meters in Victoria, Australia... https://www.ncbi.nlm.nih.gov/pubmed/25478801

Dr. De-Kun Li Provides Testimony to the FCC on Smart Meter Harm.

Dr. De-Kun Li Testimonial Letter to FCC regarding electromagnetic radiation. https://ecfsapi.fcc.gov/file/7022311506.pdf

Dr. De-Kun Li Testimony FCC- Docket2011-00262 https://ecfsapi.fcc.gov/file/7520940945.pdf

An Inconvenient Truth: Richard H. Conrad, Ph.D. Pre-Filed Testimony to Maine PUC on smart Meters

Dr. Conrad, who received a Biochemistry degree from John Hopkins University and completed post graduate work at the Institute of Molecular Biophysics of Florida State University and in the Department of Biochemistry of Cornell University, gave clear and compelling expert testimony to the Maine Public Utilities Commission in 2013 regarding Smart Meters. He describes the key issues with development of electrosensitivity symptoms after the installation of Smart Meters, reporting on his own Smart meter survey. He dispels the myths of electrosensitivity and provides scientific evidence that electrosensitivity in NOT a nocebo effect. Dr. Conrad notes, "If a government agency or a corporation was forcing the deployment of technology on citizens that was known in advance to cause disability or significant harm to one out of every 100 citizens, would this amount of harm be "acceptable" or would it be cause to halt such deployment? What would the probability of harm have to be to be prevent deployment? The actual acceptable limit chosen would probably be proportional to the perceived degree of necessity of the particular technology. Most technology is not as necessary as we think it is. There is always a safer design. The precautionary principle is the only ethical way to proceed.

AN INCONVENIENT TRUTH: Smart meters are sensitizing hundreds of thousands, maybe millions of people all over the world to become Electrically HyperSensitive, regardless of the stubborn adherence of industry and the FCC to thermal "safety" standards. Their response to non-thermal evidence is to ignore, disregard, deny, and above all, disbelieve. They neither conduct nor support unbiased non-thermal effects research." Dr. Conrad-Maine Public utilities Commission Testimony on Smart Meters. 2013.

Health Effects Reported with Smart Meters

Once these Smart Meters began to be installed in different states, reports of adverse health effects similar to electrosensitivity surfaced. These symptoms include fatigue, insomnia, poor concentration and heart palpitations. These are especially noted when Smart Meters are installed near where peoples heads are in the bedroom. When the Smart Meters were removed many people reported their symptoms resolved. Some people have to leave there homes due to immediate severe adverse symptoms. Because of the widespread health effects that were observed, in addition to reports of inaccurate inflated billing and privacy issues, at least 24 states have a Smart Meter Opt Out Law of one degree or another . Smart Meter Opt Out Laws in 24 States Massachusetts is one of the most recent states to consider a similar Bill-S1684 Smart Meter Opt Out Massachusetts.

Opt Out Option in 24 States

Many citizens and community groups have organized in the United States and abroad to oppose and stop Smart Meter installations for several reasons, including health effects. As noted above 24 states now have an opt out option. Reports of harassment and power being shut off has raised concern and awareness about this issue. Michigan is now in the middle of assessing their utility, DTE Energy Corporation, with testimony being entered into the record for 2018 (see below). Massachusetts is the latest to propose legislation allowing opt outs for smart meters Massachusetts Bill S 1864 , **S 1864-An Act relative to utilities, smart meters, and ratepayers' rights.**

In Northern California you can call Pacific Gas and Electric (PG&E) Opt Out Program at 1-866-743-0263 and ask to Opt Out or call your local utility. People who do not wish to keep their Smart Meters in the 24 states that allow this can call their local utility as well to return back to an analogue meter with a human meter reader. Note that municipalities vary even in states to allow opting out of Smart Meters.

Smart Meters: A National Crisis?

In this article in Health Impact News Smart Meters are discussed in detail and an engineer directly measures the difference between Smart Meters and Cell Towers.

Smart Meters: Countdown to a National Crisis of Illness and Death. April 15, 2018.Smart Meters- A National Crisis

How Smart Meters Work

Experienced engineer and lecturer Rob States describes below how Smart Meters and the mesh network is created in neighborhoods. He discusses how Smart Meters can increase exposure to potentially harmful microwave radiation. In addition, he looks at how Italy uses somewhat different "smart meters" that do not emit microwave radiation.



The "Dark Side " of Smart Meters . Robert States describes the many dilemmas with Smart Meters including health, privacy and home security.

Are There Safer Smart Meters? Truckee California is Testing This

Jeromy Johnson, on his website http://www.EMFAnalysis.com, Do You Have a Smart Meter?, examines conventional Smart Meters versus newer models put in Truckee, California, that transmit infrequently and only once a month when the truck reader comes by. Are these safer? The question remains, however the Truckee Donner PUD aims to " have the least amount of RF in their community as possible." They also allow Opt Outs to any of its customers and they do not force this untested technology on their residents.

Smart Meter Versus Fruit Tree



This non-scientific observational testimonial video from **EMF Analysis.com** demonstrates what scientists have found with non-thermal cell tower radiation effects on trees. There are widespread environmental effects now emerging in peer reviewed journals. For Scientific Literature Environmental Effects see https://mdsafetech.org/environmental-and-wildlife-effects/

• Radiofrequency radiation injures trees around mobile phone base stations. (2016) Waldmann-Selsam C. Sci Total Environ. 2016 Dec 1;572:554-569. https://www.ncbi.nlm.nih.gov/pubmed/27552133.

Privacy, Hacking and Fire Concerns

Hacking of smart meters has been reported for many years. In 2009 a series of hacking incidents was reported in **Puerto Rico** where smart meters were altered and settings changed to reduce electricity bills. The FBI got involved at that time. Hackers with not much sophistication according to experts can take control of your electricity as well as any IoT devices that are connected. Hackers RF device fools the "Smart Meter" into thinking it is a cell tower.

12/17/2018

IoT devices have unique signature loads and this information can be linked to personal information useful to police but also to others for surveillance purposes. Legitimate hacking concerns surround identity theft, burglary and vandalism.

Invasive surveillance makes consumers and the ACLU uncomfortable. A recent **May 2018 article** in the North Jersey USA Today states "Electric cars take the surveillance potential one step further, according to Kate Connizzo of the ACLU in Vermont, one of six states with more than 80 percent residential smart-meter penetration. "Determining how much electricity was required to recharge an electric car, and extrapolating from that how far it had traveled, would seem to be a pretty simple matter," said Connizzo. "Put all this together with such devices as automated license plate readers, surveillance cameras, facial recognition technology, and you construct a detailed record of a person's movements and activities."

Fires and explosions have also been **reported** with smart meters that overload. This is another potential risk. EMF Safety Network has complied a **list** of smart meter fires. Installing smart meters takes expertise and time. According to an **interview** with a former Wellington Energy employee who installed smart meters, there was improper training. If the smart meter is placed too close to a gas line there could be arcing with resultant explosion.

Privacy of utility billing and usage has been a consumer priority. Third party regulations lag behind in many states, however, some have put in place laws that afford some protection of information. The California Public Utilities Commission was the first to establish rules to protect the privacy and security of customer smart meter usage data to third parties. Unfortunately, when electricity data is transferred to a third party, utilities can no longer reasonably protect that information.

BALANCING SMART GRID DATA AND CONSUMER PRIVACY. Lexington Institute. June 2017.

Smart Electricity Meters Can Be Dangerously Insecure, Warns Expert. The Guardian, Dec 29, 2016.

San Diego Lawsuits Over Smart Meters: For Electricity, Then Water and Now for Everything

As Smart Meter systems are being installed in cities, there has been no premarket testing of these devices and no consideration for privacy or cybersecurity. All are significant threats to the health and wellbeing of the communities where these have been and are soon to be installed.

Electric Monitoring: In 2012 A San Diego Woman filed a lawsuit after her Smart Meter was installed and she became ill with symptoms typical of electrosensitivity. **Smart Meter Lawsuit Filed in Federal Court by San Diegan**

Water Monitoring Smart Meters: This 2018 lawsuit challenges where they money for these meters is coming from and rate increases. Environment Report: Lawsuit Targets Smart Water Meters

Population Monitoring: Jan 2018. New "Smart" monitoring equipment has been placed on streetlights in San Diego to monitor the sounds and sights of those in the city, as well as temperature, humidity and air pollution which will be uploaded to AT&T cloud. They claim it will save energy. **San Diego Installs Smart Streetlights to Monitor the Metropolis**

Testimony Smart Meters

Michigan House Energy Policy Committee Hearing 1/16/18 Smart Meters



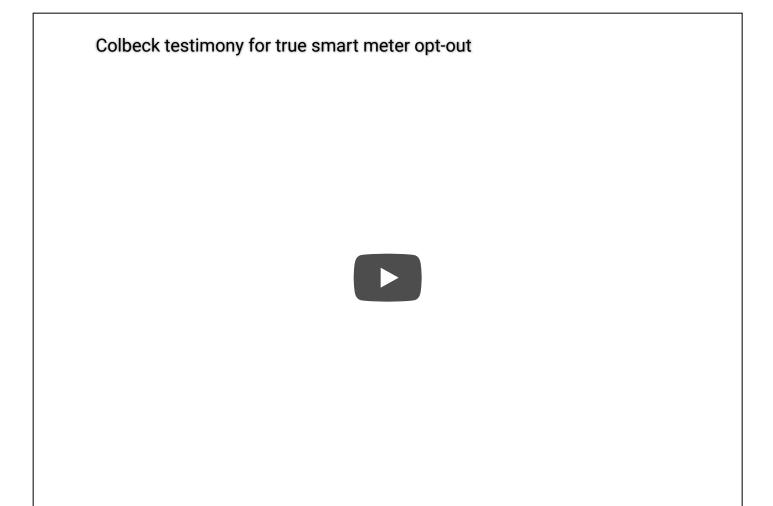
Michigan residents testify about harassment by DTE Energy Corporation, with many testifying to poor customer service, lack of communication, un-consented removal of analogue meters with placement of Smart Meter as well as people having their power abruptly shut off.

At time **43:49** A 90 year old woman and her caretaker discuss how her power was shut off for 2 weeks in November 2014.

At time **1:00:00** A woman discusses the lack of communication with the DTE when she requested keeping her Smart Meter due to health issues with ultimate shutting off of her power.

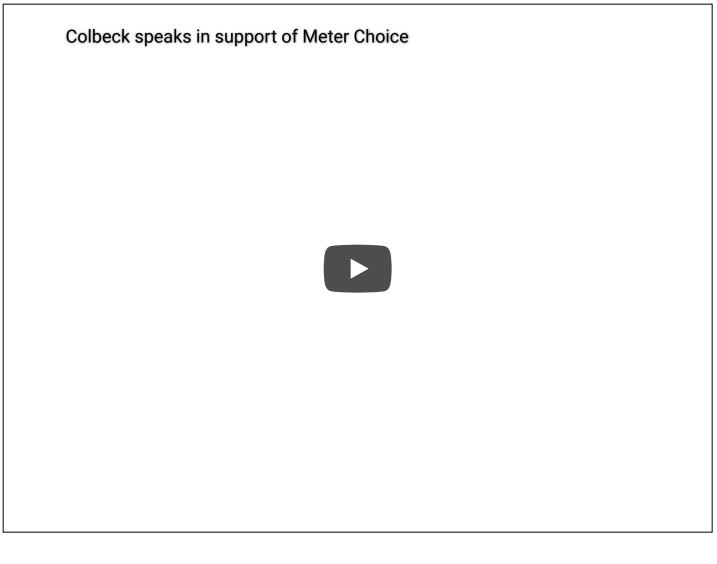
At time **1:17:15** A doctor discusses her electrosensitivity and the lack of knowledge and respect for her condition from DTE when her power was shut off because of her refusal to have a Smart Meter.

Michigan Senator Patrick J. Colbeck Speaks on concerns about Smart Meters as a Part of Smart Grid and support for HR 4220 to allow Opt Out, March 9, 2017



Michigan Senator Patrick J. Colbeck discusses security threats and consumer protections regarding Smart Meters and a Smart Grid. He highlights a study done in California on failure mode and effects analysis showing that the power to our homes, offices and businesses is put at risk by using Smart Meters. Analogue meters do not carry this risk. He puts Smart Meter risks in three broad categories- **National Security, Business Liability and Family Security.** He quotes former CIA Director James Woolsley, " A so called "Smart Grid" that is as vulnerable as what we've got is not smart at all. It's a really stupid grid." **Business risks** to their operation include "threats of terrorism" and "Cyber attacks". These are listed in the Michigan DTE 10K filing. "Technology systems are vulnerable to disability or failures, due to hacking, viruses, acts of war..." Regarding **Family risks** there are No surge protectors thus risking fires, no conducted emissions filter leading to early appliance failure, Cyber security back-door access for hackers, no circuit breaker between the meter and the power source.

Michigan Senator Patrick J. Colbeck Speaks in Support of Smart Meter Choice for Opt Out, Nov 10, 2016



Senator Patrick Colbeck speaks in support of property rights to allow property owners the choice of having a Smart Meter during the November 10, 2016 session. He notes that there are many reasons citizens wish to have an analogue meter rather than a Smart Meter. These concerns include privacy, health, accurate pricing and data hacking on usage profiles. He states this comes down to property rights and the ability of people to refuse a device that causes substantial harm. Senator Colbeck notes there is no substantial harm in letting people have a choice.

Dr. Martin Pall Testimony in Massachusetts on Smart Meters



Dr. Martin Pall, Professor Emeritus at Washington State University and author of many papers on EMR on cellular structures, testifies June 20, 2017 in Massachusetts on Smart Meter bill SB1864.

http://healthimpactnews.com/2017/smart-meters-countdown-to-a-national-crisis-of-illnessand-death/

Power Cut off in 4 North Carolina Homes as They Refuse Smart Meters.



On June 28, 2018, four Asheville North Carolina homes had their power cut off for refusing Smart meters. No advanced notice was given according to the residents. They state they had signed a notarized document requesting removal of smart meters and replacement with analogue meters.

Smart Meters, Dirty Electricity and Disease



Dr. Sam Milham, physician, epidemiologist and author of the book Dirty Electricity, is featured here, explaining smart meter devices, dirty electricity and adverse health effects. Informative. Research papers he highlights can be found on his website Sam Milham Research Papers.



Advisory Board



DAVID BLASK, PH.D., M.D.

Dr. Blask is currently Professor of Structural & Cellular Biology, Tulane Univ. School of Medicine, where he is also the Head of the Laboratory of Chrono-Neuroendocrine Oncology and Associate Director of the Tulane Center for Circadian Biology. He is also a member of the Tulane Cancer Center. For 30 years he has focused his research on circadian rythms, therapeutics of cancer by melatonin as well as the consequences of the circadian disruption of melatonin production by light at night on cancer risk. He has published over 250 journal articles, reviews, chapters and abstracts on this topic. His research has been supported by funding agencies such as the National Cancer

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VICTORIA DUNCKLEY, M.D.

Dr. Victoria L. Dunckley is a board-certified integrative child psychiatrist in Los Angeles, California with a special focus on the physiological impact of screen-time on the developing nervous system, mood, focus, sleep, and behavior. Dr. Dunckley has found in her extensive experience that interactive screen-time can overstimulate and stress the developing nervous system, particularly in children with vulnerabilities. She is the author of Reset Your Child's Brain: A Four Week Plan to End Meltdowns, Raise Grades and Boost Social Skills by Reversing the Effects of Electronic Screen-Time.

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SCOTT EBERLE, M.D.

Dr. Scott Eberle is a physician specializing in end-of-life care. He is medical director for Hospice of Petaluma in Petaluma, California. Having first learned *the science of medicine* at U.C. San Francisco Medical School, he learned *the art of medicine* from countless people living and dying with AIDS during the '80s and '90s. In 2005, he ended his 16-year career as an AIDS specialist so he could focus on end-of-life care. His book, "The Final Crossing: Learning to Die in Order to Live," was published in 2006. Dr Eberle also co-founded "The Practice of Living and Dying", an innovative wilderness curriculum for which he is also a guide.



ROXANA MARACHI, PH.D.

Roxana Marachi, Ph.D. is Associate Professor at Connie L. Lurie College of Education at San Jose State University. She received her Ph.D. from the University of Michigan. Dr. Marachi's expertise includes analysis of learning environments, motivation, cognition, social climate, and behavior. She has a special focus on the impact of computers on childhood development, learning and psychosocial effects on students of all ages. She is a passionate advocate for connecting the most recent research on how we learn socially, emotionally, and cognitively with practical applications for improving learning, academic achievement and work environments. Dr. Marachi has authored numerous articles on school violence, bullying and social psychology in education. She has received numerous awards for her work.



JOEL MOSKOWITZ, PH.D.

Joel M. Moskowitz, Ph.D. is the Director of the Center for Family and Community Health, School of Public Health, UC Berkeley. Dr. Moskowitz has conducted research on disease prevention programs and policies for more than 30 years, most recently focusing on adverse health effects of wireless radiation. In 2009 he served as the senior author on a hallmark paper reviewing research on mobile phone use and increased brain tumor risk published in the Journal of Clinical Oncology . He has disseminated research related to wireless technology, public health and policy since 2009. He is an advisor to the International EMF Scientist Appeal signed by more than 220

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JERRY L. PHILLIPS, PH.D.

Jerry L. Phillips is Director of the Excel Science Center and Professor Attendant of Chemistry & Biochemistry at University of Colorado in Colorado Springs. He earned his B.A. in Chemistry from the University of Colorado at Boulder and his Ph.D. in Biochemistry from

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Colorado State University, Ft. Collins, CO. He then was a postdoctoral fellow of the American Cancer Society at the McArdle Cancer Research Laboratory (University of Wisconsin, Madison, WI). Dr. Phillips began his academic career at the University of Texas at San Antonio. He later moved to the University of Texas Health Science Center in San Antonio, Department of Medicine, Division of Oncology, where he was also Senior Scientist and Director of the Phase I Drug Development Laboratory at the Cancer Therapy and Research Center. Phillips then moved to

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CINDY RUSSELL, M.D.

Cindy Russell, M.D., Executive Director of Physicians for Safe Technology, is a plastic surgeon practicing in Mountain View, California. She completed her residency training at Stanford University Medical Center. Treating breast cancer patients and witnessing the epidemic of breast cancer over the last 30 years, she became interested in public health and the root causes of chronic illness along with prevention strategies. Dr. Russell has been Chair of the Santa Clara County Medical Association (SCCMA/MCMS) Environmental Health Committee since 1995 and has been VP of Community Health for the SCCMA/MCMS since 2010. During that time she has authored many policy resolutions related to reducing environmental toxins at the California Medical Association House of Delegates. In 2001 she led the effort to pass the Santa Clara County Integrated Pest Management ordinance to reduce pesticide exposure on County property. She remains on the SCCIPM Task Force.



CINDY SAGE, M.A.

Cindy Sage, M.A. is an environmental sciences consultant and researcher on electromagnetic fields and radiofrequency radiation. She is a founder of the international Biolnitiative Working Group, and the co-editor and principal author of the Biolnitiative Reports (2007 and 2012). Ms. Sage has provided expert testimony and scientific briefings on non-ionizing radiation to the European Environmental Agency (Denmark), the European Commission (Brussels), UK Health Protection Agency, UK Children with Leukemia registered charity, and various international health agencies, US Department of Justice, Federal Communications Commission, US Food and Drug Administration, public utilities commissions, US Green Building Council, state legislative committees, and numerous state and municipal agencies and commissions. She co-authored the 2010 Seletun (Norway) Scientific Consensus Statement on Wireless RFR Risks. In 2002, she worked with the California Department of Education on

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JOHN WEST, M.D. https://mdsafetech.org/advisory-board/

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Dr. John West is a general surgeon and researcher specializing in breast care health and comprehensive breast cancer treatment. He is the director of surgery at Breastlink of Orange in Southern California as well as founder and chair of the board of the Breast Health Awareness Foundation, a community outreach program dedicated to the early detection of breast cancer. Dr. West completed his medical and surgical training at the University of California San Francisco. He became fascinated with the multi-disciplinary team approach to breast cancer care in the mid 1980's after studying and reporting on multidisciplinary systems of Trauma care in Orange County. He opened Orange County's first breast care center in 1988. Dr. West has been the lead author in 20 peer review articles on breast cancer and breast care including a 2013 article "Multifocal Breast Cancer in Young Women with Prolonged Contact between Their Breasts and Their Cellular Phones". He is author of "Prevent, Survive, Thrive: Every woman's guide to optimal breast care".

Dr. Cindy Russell

SCCMA V.P. Community Health

t would greatly extend FCC's current policy of the mandatory irradiation of the public without adequate prior study of the potential health impact and assurance of safety. It would irradiate everyone, including the most vulnerable to harm from radiofrequency radiation: pregnant women, unborn children, young children, teenagers, men of reproductive age, the elderly, the disabled, and the chronically ill." —Ronald Powell, PhD, Letter to FCC on 5G expansion (7)

BRAVE NEW WORLD OF COMMUNICATION

The use of mobile wireless technologies continues to increase worldwide. A new faster 5th generation (5G)-telecommunication system has recently been approved by the Federal Communications Commission (FCC) with new antennas already being installed and tested in Palo Alto and Mountain View. While it may give us uber automation and instantaneous "immersive entertainment" a lot of questions remain with regards to public health and safety of wireless devices. Will the adoption of this new 5G technology harm directly or indirectly the consumers and businesses it hopes to attract?

5G is the new Promised Land for wireless technology. It could connect us in our homes, workplaces and city streets to over a trillion objects around the world. (96) The Internet of Things (IoT) is primed to give us self-driving cars, appliances that can order their own laundry soap, automation hubs that pay your bills, not to mention fast movie downloads and virtual reality streaming from anywhere when you are on the go. Companies are already asking local cities and counties to move forward to create "Smart Cities" which have comprehensive digital connectivity by installing a massive wireless sensor network of almost invisible small cell antennae on light posts, utility poles, homes and businesses throughout neighborhoods and towns in order to integrate IoT with IT. They state it will improve services, the economy and quality of life. This communication network will form an expanded electromagnetic microwave blanket above each city and county, permeating the airspace and providing seamless connectivity where people and things will exchange data.

Former Federal Communications Commission (FCC) chair Tom Wheeler called this a "National Priority" and thus ushered in approval for the addition of this new pervasive network of high frequency short wave millimeter broadband for commercial use first planned in urban areas.

DEVELOPING A "SMART" WORLD?

Engineers and physicists are busy working out the details of carrier frequencies and the architecture of the new network. Manufacturing industries are already developing commonly used products that feature wireless integration that will connect to the densely clustered antennas. Marketing companies are now pushing ads for "smart" devices for "smart" people in "smart" cities. Even the healthcare industry is anticipating using some of these wearable devices for patients with cardiac conditions or to do remote surgery in other parts of the world. Opening up 5G Spectrum access hopes to drive an explosion of new products. The economic opportunities are obvious and business will be booming in the tech industry.

Concerns continue to rise however about the basic safety of our current use of wireless technologies not to mention adding layers of newer microwave frequencies that have not been tested for short term or long term safety. Important questions have not been addressed while industry and government policy have already moved forward.

- Why is the FCC streamlining permitting of 5G high frequency when they have not completed their investigation on health effects nor updated safety limits for low-intensity radio frequency radiation?
- Is the widespread "deployment" of this pervasive higher frequency small cell distributed antennae system in our cities and on our homes safe for humans and the environment?
- Will it add to the burden of chronic disease that costs our nation over a trillion dollars annually? (105)
- Are we already digitally over connected, outsourcing our grey matter and becoming a dysfunctional addicted nation because of it? (136,137,138)
- How will this affect our privacy, cyber security and the security of medical records?
- Will we, as physicians be able to recognize the emerging adverse health effects of new millimeter technology and wearable technology let alone that of current wireless devices?

A GOOD READ: FEDERAL COMMUNICATIONS COMMISSION 5G LETTERS

Letters to the FCC in 2016 responding to the 5G roll out with the addition of new high frequencies were mixed. Industry generally applauded the FCC for its efforts and discussed the growing demand for this technology along with a need for flexible regulation to implement it. Some expressed concerns about interference with other satellite systems. Some felt there should be maximum spectrum usage opening up even higher frequencies that are only experimental now in order to help "the underserved". Others argued about opening this up to licensed versus unlicensed uses. Industry did not mention any potential public or environmental health hazards regarding the use of these new frequencies.

RAISING A RED FLAG TO PUSH THE PAUSE BUTTON ON 5G

Private citizens and PhD's however did raise a red flag at the FCC, recommending a halt to infrastructure plans and more testing for health and environmental reasons. They questioned the current FCC standards, which are outdated and not protective of human health. They asked, "How will it affect children, pregnant women and the elderly who are the most vulnerable in our population?"

While scientists gave ample evidence that precaution should prevail, I found the most compelling letters were from those who describe their fear as electro-sensitive people in an already dangerously high electromagnetic environment for them.

GIMME SHELTER: NO ESCAPE FOR ELECTRO-SENSITIVE INDIVIDUALS

Linda K., a Michigan resident, explained how she became increasingly sensitive to EMF after a cell tower was placed within 1000 feet of her house.

She experienced insomnia at first and did not know there was a cell tower until several years later when she then associated the timing of its placement with her symptoms. After smart meters were installed in her area (but not on her house) she became sensitive to her laptop on wireless and her cell phone. Comcast then placed a Wi-Fi hotspot within 400 feet of her house and she stated her symptoms increased to the point that if she was outside in her yard more than 20 minutes she developed increasing fatigue, headaches, heart palpitations and high pitched ringing in her ears. These are all reported effects in those sensitive to EMF from wireless devices. She wrote about her concerns and that the new frequencies may add to her symptoms and inability to leave her house. (54)

In another letter Veronica Z. noted, "This is a notice of survival. What many of us deal with currently is trying to survive in an environment that is hostile to us biologically. We have lost all of our rights, our finances, our homes, and our ability to earn a living due to this ubiquitous exposure. We are being tortured every second of every day and have been reduced to simply trying to survive the moments we are alive. Others have been unable to do so and have opted to not stay living on this planet of torture...There is no escape for people with severe sensitivities to this deadly radiation." (55)

ASK NASA: IS ELECTRO-SENSITIVITY REAL OR IMAGINED?

Are these people telling the truth? Is this just psychological? You may wonder, however, more and more people from all ages, professions and walks of life are relating similar symptoms in the presence of wireless devices. Some children reported these symptoms when their school adopted Wi-Fi.

Dr. Scott Eberle, a well-respected Petaluma hospice physician, eloquently described his development of electro-sensitivity in the November 2016 issue of the SCCMA Bulletin. He goes to great lengths to continue his profession, interact with his colleagues and maintain a healthy existence. (67)

We are exposed to increasing levels of microwave EMF in our daily lives. More scientific evidence links biologic effects with increased reports of health related effects including electrosensitivity. In 1971 Russian scientists Gordon and Sadchikova from the Institute of Labor Hygiene and Occupational Diseases described a comprehensive series of symptoms which they called 'microwave sickness' and presented this at an international WHO meeting. (109)

In a 1981 NASA report, "Electromagnetic Field Interactions: Observed Effects and Theories" microwave sickness was also described. The symptoms recorded were headaches, eyestrain, fatigue, dizziness, disturbed sleep at night, sleepiness in daytime, moodiness, irritability, unsociability, hypochondriac reactions, feelings of fear, nervous tension, mental depression, memory impairment, pulling sensation in the scalp and brow, loss of hair, pain in muscles and heart region, breathing difficulties, increased perspiration of extremities. (63)

THE SCIENCE OF ELECTRO-SENSITIVITY

Belpomme, in 2015, completed the most comprehensive study of electrosensitivity, investigating 1216 people: 71.6% with EHS, 7.2% with CS, and 21.2% with both. They found an elevation in several reliable disease biomarkers—each occurring within a range of 23% to 40% of all cases—which prompted their conclusion that these sensitivities can be objectively characterized and diagnosed and "appear to involve inflammation-related hyper-histaminemia, oxidative stress, autoimmune response, capsulothalamic hypoperfusion and pathologic leakage of the blood-brain barrier, and a deficit in melatonin metabolic availability" (68)

THE SCIENCE OF EMF BIOLOGICAL HARM

The scientific literature abounds with evidence of non-thermal cellular damage from non-ionizing wireless radiation for several decades. There are likely several mechanisms both direct and indirect. Oxidative damage is one that has been well studied. Effects have been demonstrated on cell membranes causing a shift in the voltage gated calcium channels. Sperm studies have consistently found genotoxic, morphologic and motility abnormalities in the presence of cell phone radiation. DNA damage, blood brain barrier effects, melatonin reduction, nerve cell damage, mitochondrial disruption and memory disturbances have been revealed. The Bioinitiative Report (139) has chronicled these effects and a growing wave of PEER reviewed studies is building on that base daily. In 2011, the International Agency for Research on Cancer classified radiofrequency as 2B carcinogen and "possibly carcinogenic to humans", the same category as DDT, lead and other pesticides

THE LATEST SCIENCE: NATIONAL TOXICOLOGY PROGRAM STUDY ON CELL PHONES AND CANCER

The most recent and compelling evidence has come from the 2016 National Institutes of Health, National Toxicology Program. Called the NTP Toxicology and Carcinogenicity Cell Phone Radiation Study, the 10-year \$25 million research revealed conclusively that there was a harmful effect from cell phone microwave radiation. (124,125) The frequencies are similar to other wireless devices we commonly use. The studies were robust, collaborative, well controlled and with double the number of rats required to reveal a significant effect, if present. The preliminary results of the study showed that RFR caused a statistically significant increase in two types of brain tumors, gliomas and schwannomas. These were the same two types of tumors shown to increase in human

epidemiological studies on long-term use of cell phones. Dr. Lennart Hardell and others have demonstrated a consistent pattern of increased incidence of ipsilateral (same side) acoustic neuromas (vestibular schwannomas) and gliomas with each 100 hours of cell phone use. (112-118) Another telling finding was that the control rats had much lower than expected cancer rates. It is believed due to the fact the control rats were in a controlled faraday cage and not exposed to normal ambient EMF that could contribute to cancer.

Ron Melnik, PhD, Senior Toxicologist and Director of Special Programs in the Environmental Toxicology Program at the National Institute of Environmental Health Sciences (NIEHS) and designer of the study states, "The NTP tested the hypothesis that cell phone radiation could not cause health effects and that hypothesis has now been disproved. The experiment has been done and, after extensive reviews, the consensus is that there was a carcinogenic effect." (124,125,126,127)

HEALTH EFFECTS OF MILLIMETER 5G WAVELENGTHS

The term "millimeter waves" (MMW) refers to extremely high-frequency (30-300 GHz) electromagnetic radiation. Millimeter Waves (MMW) used in the next-generation of high-speed wireless technologies have shallow penetration thus effect the skin surface, the surface of the eye or on bacteria, plants and small life forms. Surface effects, however, can be quite substantial on an organism as stimulation of skin receptors can affect nerve signaling causing a whole body response with physiological effects on heart rate, heart rhythm, and the immune system.

In a 1998 review article, Pakhomov (123) looked at the bio-effects of millimeter waves. He reviewed dozens of studies and cites research demonstrating profound effects of MMW on all biological systems including cells, bacteria, yeast, animals and humans. Some effects were clearly thermal as millimeter microwaves are rapidly absorbed by water, which is abundant in living organisms. When microwaves are absorbed the energy can cause tissue heating. Many of the millimeter frequency studies however showed effects without heating of tissues and at low intensities. Research was variable and showed both regenerative effects and also adverse effects depending on frequency, power and exposure time.

ARRYTHMIAS

Chernyakov induced heart rate changes in anesthetized frogs by microwave irradiation of remote skin areas. Complete denervation of the heart did not prevent the reaction. This suggested a reflex mechanism of the MMW action involving certain peripheral receptors. (28)

HEART RATE VARIABILITY

Potekhina found certain frequencies from 53-78 GHz band (CW) changed the natural heart rate variability in anesthetized rats. He showed that some frequencies had no effect (61 or 75 GHZ) while other frequencies (55 and 73 GHz) caused pronounced arrhythmia. There was no change in skin or whole body temperature. (69)

TERATOGENIC EFFECTS

One study of MMW teratogenic effects was performed in Drosophila flies by Belyaev. Embryos were exposed to 3 different GHz frequencies for 4-4.5 hours at 0.1 mW/cm2. He found that irradiation at 46.35 GHz, but not at 46.42 or 46.50 GHz, caused marked effects including an increase in morphological abnormalities and decreased survival. It was felt the MMW disturbed DNA-protein interactions at that particular frequency. (65)

BACTERIAL AFFECTS AND ANTIBIOTIC RESISTANCE

Bulgakova in over 1,000 studies with 14 different antibiotics showed how MMW exposure of S. aureus affects its sensitivity to antibiotics with different mechanisms of action. The MMW increased or decreased antibiotic sensitivity depending on the antibiotic concentration. (134)

Pakhomov warns, "Regardless of the primary mechanism, the possibility of significant bio-effects of a short-term MMW irradiation at intensities at or below current safety standards deserves consideration and further study. The possibility of induction of adverse health effects by a local, low-intensity MMW irradiation is of potential significance for setting health and safety standards and requires special attention." He called for replication of studies especially long-term effects of MMW.

His conclusions

- Individuals or groups in a population, which would usually be regarded as uniform, may react to MMW in rather different or even opposite ways
- There seem to exist unknown and uncontrolled factors that determine the MMW sensitivity of a specimen or a population. Irradiation could increase antibiotic resistivity in one experiment and decrease it in the next one

Increased sensitivity and even hypersensitivity of individuals to MMW may be real. Depending on the exposure characteristics, especially wavelength, a low-intensity MMW radiation was perceived by 30 to 80% of healthy examinees (123)

CATARACTS

Prost in 1994 studied millimeter microwave radiation on the eye. He noted that microwaves of different wavelengths could induce the development of cataracts. (13) His research found that low power millimeter waves produced lens opacity in rats exposed to 10mW/cm2, a predisposing indicator of cataracts. (74)

IMMUNE SYSTEM

Kolomytseva, in 2002, looked at the dynamics of leukocyte number and functional activity of peripheral blood neutrophils

under whole-body exposure of healthy mice to low-intensity extremely high frequency electromagnetic radiation (EHF EMR, 42.0 GHz, 0.15 mW/cm2, 20 min daily). The study showed that the phagocytic activity of peripheral blood neutrophils was suppressed by about 50% in 2-3 h after a single exposure to EHF EMR. (131)

CHROMATIN EFFECTS

Gapeve in 2003 showed for the first time that low-intensity extremely high-frequency MMH electromagnetic radiation in vivo causes effects on spatial organization of chromatin in cells of lymphoid organs. Chromatin is a complex of DNA and proteins that forms chromosomes within the nucleus of eukaryotic cells. He exposed mice to a single whole-body exposure for 20 min at 42.0 GHz and 0.15 mW/cm2. (132)

GENE EXPRESSION

Habauzit in 2013 looked at gene expression in keratinocytes with 60GHz exposure at upper limit of current guidelines and concluded "In our experimental design, the high number of modified genes (665) shows that the ICNIRP current limit is probably too permissive to prevent biological response. (73)

GAPS IN DATA FOR LAUNCHING 5G MILLIMETER DEVICES

Commercial production often precedes research on consumer protection and health effects. We have too many toxins that have escaped premarket safety protocols for too long-lead, asbestos, smoking and our modern unregulated nanoparticles to mention just a few. These affect our long term and short-term health in ways we do not even know. If we become ill, we do not question or identify the daily or weekly chemical exposures that could have contributed to that cancer or arthritis or lung disease or Alzheimer's. We have too many toxins to sort it all out.

Research shows that wireless microwave radiation ads yet another dose of toxic exposure to our daily lives. We cannot hear it or smell it or feel it. Yet it affects our biology and our wellbeing with perhaps subtle affects. If we are electro-sensitive then we are more likely to avoid exposure. Trees are even susceptible to EMF harm and they cannot move away. (128) What about birds and bees and us?

CLOSE ENCOUNTERS: GOOGLE GLASS, VIRTUAL REALITY AND WEARABLE WIRELESS DEVICES

If we are concerned about putting a cell phone to our ears for long periods of time after reading about the NTP study then why aren't we concerned about other wearable devices? While very cool to use Google Glass and Virtual Reality may have dangerous consequences to our eyes, brain function or immune systems with long term use, especially to children. What are the frequencies in these devices? 3G, 4G, 5G or a combination of zapping frequencies giving us immersive connection and entertainment but at a potentially steep price.

5G RESEARCH AND POLICY

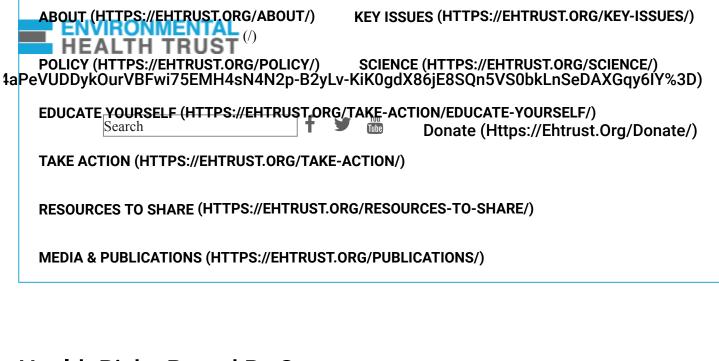
Safety testing for 5G is the same as other wireless devices. It is based on heat. This is an obsolete standard and not considering current science showing cellular and organism harm from non-thermal effects. There is a large gap in safety data for 5G biological effects that has been demonstrated in older studies including military.

NEW RECOMMENDATIONS TO PROTECT PUBLIC HEALTH

Do not proceed to roll out 5G technologies pending pre-market studies on health effects

- Reevaluate safety standards based on long term as well as short-term studies on biological effects
- Rescind a portion of Section 704 of the Telecommunications Act of 1996 which preempts state and local government regulation for the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects so that health and environmental issues can be addressed
- Rescind portions of The Spectrum Act which was passed in 2012 as part of the Middle Class Tax Relief and Job Creation Act, which strips the ability city officials and local governments to regulate cellular communications equipment, provides no public notification or opportunity for public input and may potentially result in environmental impacts
- Create an independent multidisciplinary scientific agency tasked with developing appropriate safety regulations, premarket testing and research needs in a transparent environment with public input

Label pertinent EMF information on devices along with appropriate precautionary warnings.



Health Risks Posed By Smartmeters

(/#facebook) (/#twitter) (/#google_plus) (https://www.addtoany.com/share#url=https%3A%2F%2Fehtrust.org%2Ftake-action%2Feducateyourself%2Fhealth-risks-posed-bysmartmeters%2F&title=Health%20Risks%20Posed%20by%20Smartmeters)



What are Smartmeters?

Smartmeters are the new utility consumption measurement devices for electricity, water, and gas that are being installed across the nation, at residences and other buildings. There would be a separate meter for each type of utility and they are installed by the companies and governments that provide the utilities.

 ABOUT (HTTPS://EHTRUST.ORG/ABOUT/)
 KEY ISSUES (HTTPS://EHTRUST.ORG/KEY-ISSUES/)

 Most people are unaware that their meter has been switched or is in the process of being

 swRoheo/f(HTTPs://EHTRUST.ORG/POLECM/gital "SOURCE/POLECM/gital" SOURCE/PS//EHTRUSE ORG/SIGURYCE//eady had

 a meter, it was probably an analogue meter (used for decades), but the the replacement meter is

 likedpucchotexet.Fs/HSTPS://EHTRUST.ORG/TAKE-ACTION/EDUCATE-YOURSELF/)

 Read Dr. David Carpenter's letter on smartmeter health impacts PDF of Letter

 TAKE ACTION (HTTPS://EHTRUST.ORG/TAKE-ACTION/)

 (https://ehtrust.org/wp-content/uploads/Carpenter-Letter.pdf)

 WHRESOPECENTEC CHARGE/CHTRUST.ORG/PUBLICATIONS/)

 about the different types of smartmeters: some are called AMI, AMR and PLC. To learn more

 MEDIA & PUBLICATIONS (HTTPS://EHTRUST.ORG/PUBLICATIONS/)

 about the different types of meters, we recommend Dr. Ronald Powell's paper "Ranking

 Electricity Meters for Risk to Health, Privacy, and Cyber Security

 (https://www.scribd.com/doc/280782183/Paphing-Electricity/Meters-for-Pisk-to-Hoalth-Privacy

(https://www.scribd.com/doc/289782183/Ranking-Electricity-Meters-for-Risk-to-Health-Privacy-and-Cyber-Security)."

Some Facts About Smartmeters

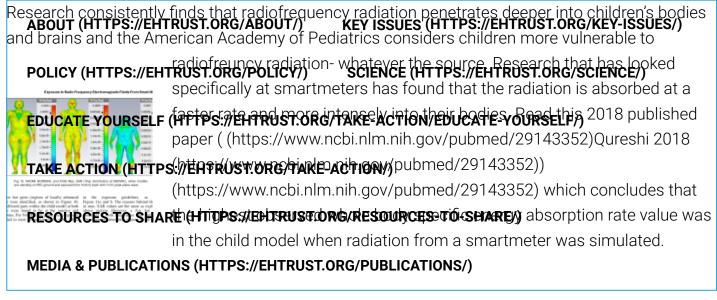
Smart Meters emit radio-frequency radiation (RFR).

Most smartmeter are designed to emit radio-frequency radiation (RFR). This is a concern because RFR is a biologically-active electromagnetic exposure that is absorbed into our bodies. Many smartmeter systems generate RFR to wirelessly communicate with other smartmeters and to the utility provider and each of these wireless communication networks increase the overall density of manmade pulsed RFR radiation outdoors and indoors, throughout a neighborhood.

The radiation generated by smartmeters is the same type as generated by your cell phoneradiofrequency radiation.

Peer reviewed science has found increased cancer, immune system damage, and headaches after exposures to radiofrequency radiation. Dr. David Carpenter's letter "Correcting the Gross Misinformation (https://maisonsaine.ca/actualites/smart-meters-correcting-the-gross-misinformation.html)" addresses the biological health effects of smartmeters.

Smartmeter radiation penetrates deeper into children's bodies.



Bees, birds and insects are exposed to higher density of RFR.

The pulsed RFR emitted by smartmeters and other wireless telecommunications poses risks to pollinators and wildlife. Published research has found negative impacts to bees,

(http://link.springer.com/article/10.1007%2Fs13592-011-0016-x#page-1) plants

(http://www.ncbi.nlm.nih.gov/pubmed/27650031?dopt=Abstract), and wildlife.

(http://www.sciencedirect.com/science/article/pii/S0160412012002334)For example, a review of 113 studies from original peer-reviewed publications found RF-EMF had a significant effect on birds, insects, other vertebrates, other organisms and plants in 70% of the studies. Development and reproduction of birds and insects are the most strongly affected endpoints. Read more. (https://ehtrust.org/science/bees-butterflies-wildlife-research-electromagnetic-fields-environment/)



Most smartmeters emit very strong pulses of RFR twenty four hours a day.

Environm	nental Health Trust Health Risks	Posed by Smartmeters - Environr	mental Health	rust			
Contrary to claims made by uti ABOUT (HTTPS://EHTRUST.OR continuously emit RFR in millis	lity providers that the G/ABOUT/) KEY IS second blasts. These	e exposure is "low." ma SSUES (HTTPS://EHTRUS short bursts of radiat	any smart ST.ORG/KE ion can be	meters Y -ISSUES/) e very			
powerful POLICY (HTTPS://EHTRUST.OR	RG/POLICY/) SCIE	NCE (HTTPS://EHTRUST	.ORG/SCIE	NCE/)			
Wireless smart meters typically	/ produce very short ł	nigh levels of pulsed R	F/microw	aves. They			
emFPU/CATEN/AUSESEFFU(HTTPR/	emEPU/CATENYAUSESELFC(Hontprat/EUTRUSTORG/JAKE)&ODAN/EBUCATEWANASELEXimum of 190,000						
daily transmissions and a peak level emission two and a half times higher than the stated safety TAKE ACTION (HTTPS://EHTRUST.ORG/TAKE-ACTION/) signal, as the California utility Pacific Gas & Electric recognized (http://www.google.com/url?							
q=http%3A%2F%2Femfsafetynetwork.org%2Fwp- RESOURCES TO SHARE (HTTPS://EHTRUST.ORG/RESOURCES-TO-SHARE/) content%2Fuploads%2F2011%2F11%2FPGERFDataOpt-outalternatives_11-1-11-							
3pm.pdf&sa=D&sntz=1&usg=AFQiCNHn5X7v3BAfs3P1JaOzxS2FY7aZYg) before that State's MEDIA & PUBLICATIONS (HTTPS://EHTRUST.ORG/PUBLICATIONS/) Public Utilities Commission when directly asked. To be clear- smartmeters can average 1900							
transmissions in a 24 hour peri	od.						
Page 1 / 1 Zoo	Page 1 / 1 Zoom 100%						
Question 2:							
How many times in total (average and maximum) is a smart meter scheduled to transmit during a 24-hour period?							
Response 2:	Response 2:						
Electric: Table 2-1 presents schedule durations. As noted in Response 1, th Table 2-1 presents data for all "sched communications in the network that o messages created only at non-recurrin	he information presented applie uled" messages; i.e., those inhe occur routinely without user into	s only to the 900 MHz radio. erently required to sustain ervention. "Non-Scheduled"					
	TABLE 2-1						
Electric System Message Type	Transmission Frequency Per 24-Hour Period: Average	Transmission Frequency Per 24-Hour Period: Maximum (99.9 th Percentile)					
[a]	[b]	[c]					
Meter Read Data	6	6					
Network Management	15	30					
Time Synch	360	360					
Mesh Network Message Management	9,600	190,000					
Weighted Average Duty Cycle	45.3 Seconds ⁴	875.0 Seconds					
 The electric system message types are defined as: Meter Read Data refers to the messages generated by each meter to transmit energy usage data. Network Management refers to network tasks that need to be performed to maintain the health of the network (e.g., route establishment). Time Synch refers to network administration messages needed to update the internal clock in the NIC. 							
 Mesh Network Message Management refers to activities required to forward routed messages. 							
	77% #		•				

Please see "Assessment of Radiofrequency Microwave Radiation Emissions from Smart Meters" (http://sagereports.com/smart-meter-rf/docs/Smart-Meter_Report.B-Tables.pdf) by Sage Associates. This research uses computer modeling that has found potential violations of current FCC public safety standards for smart meters and/or collector meters in the manner installed **ABOUT (HTTPS://EHTRUST.ORG/ABOUT/)** and operated in California are predicted in this Report. Download this entire report as a PDF file (http://sagerenorts.com/smart-meter-rf/docs/Smart-Meter_Report B-Tables.ndf) **POLICY (HTTPS://EHTRUST.ORG/POLICY/)**

EDUCATE YOURSELF (HTTPS://EHTRUST.ORG/TAKE-ACTION/EDUCATE-YOURSELF/) Smartmeter systems intentionally create a "mesh" wireless communications network which is RFR emissions. Many smartmeters work differently than cell phones. Cell phones communicate by continuous tw&&&&UECESTG&UARE (HUTTPS://EHTRUST.ORG/TAKE-ACTION/) Many smartmeters work differently than cell phones. Cell phones communicate by continuous tw&&&&UECESTG&UARE (HUTTPS://EHTB&UECESTURESOURCESTURESOURCESTING tw&&&&&UECESTG&UARE (HUTTPS://EHTB&UECESTIGESOURCESTING can communicate with each other in a wireless "mesh network." Every meter in the mesh network wirestatesourcestatesources (HTTESS://SHUTCESTINEECORG/IT USUCESTICS) meter within its mesh network (the size of the network can be all meters within one or two miles).

The data wirelessly riding on your meter's RFR emissions is collected by the utility provider's centralized hub antennas—these may be mounted on utility poles called Data Collector Units (https://stopsmartmeters.org/2011/04/18/smart-meter-antenna-damage-reported-in-santa-cruz-county-in-light-of-government-inaction-some-taking-matters-into-their-own-hands/) or be specially-programmed collector meters or other transceivers spaced throughout a community. Collector meters usually have more powerful emissions because they are communicating with the other meters in the network. Read more about mesh networks.

(https://stopsmartmeters.org/frequently-asked-questions/mesh-network-issues/)

Smartmeter radiation is neither "low" nor "safe".

Utility companies claim that the RFR emitted by wireless smartmeters and their networks meet government FCC limits. However, 20-year-old FCC limits (based on 30-year-old science) are not protective of human health and are hundreds of thousands of times too high to protect humans and wildlife from biological effects.

Peer reviewed published studies show the adverse biological effects of pulsed electromagnetic radiation, such as RFR, on the body at emissions levels far below FCC limits. You can find many of these studies at the BioInitiative Report (http://www.bioinitiative.org/), JustProvelt.net (http://justproveit.net/studies), and Environmental Health Trust. (https://ehtrust.org/science/research-on-wireless-health-effects/)

 When it comes to non-thermal effects of RF, which is the most relevant effect for public ABOUT (HTTPS://EHTRUST.ORG/ABOUT) concerns, FCC guidelines are irrelevant and can not be used for any claims of SmartMeter safety unless we are addressing heat damage." Dr. De Kin Li a Kajser research scientist who has published research on electromagnetic radiation and provided expert testimony on health concerns, FCC guidelines are irrelevant and can not be used for any claims of SmartMeter safety published research on electromagnetic radiation and provided expert testimony on health concerns for a second sec

- "Warning: To satisfy FCC RF exposure requirements for transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended." –FLEXGE100 Utility Meter (https://fccid.io/SDBFLEXGE100/User-Manual/User-Manual-1449409) Electric Smartmeter
- "RF Radiation Safety Guidelines: The meter should be installed in a location where there will be a separation greater than 20 cm (8 inches) from locations occupied by humans." – I2103G WIRELESS UTILITY METER User Manual Users Manual Itron (https://fccid.io/QHC-I2103G/Users-Manual/Users-Manual-1614606) Electric Utility Smartmeter

Smartmeters can increase the "dirty" electricity on the electrical and metal plumbing systems throughout your home.

Digital meters operate by a built-in switched mode power supply, which generates what is commonly known as "dirty electricity" and referred to by electricians and electrical engineers as "voltage transients," "voltage harmonics," "line noise," and "power quality issues." This is a concern because dirty electricity is also a biologically-active, penetrating, electromagnetic physical agent. This dirty electricity then travels throughout your home via the electrical wiring and metal pipes.

People are reporting symptoms after smartmeters are installed at their residences.

Reported symptoms include sleep disturbances, rashes, hyperactivity, changes in children's behavior, high blood pressure, endocrine problems, thyroid problems, facial flushing, nausea, flulike symptoms, body pain, leg cramps, cardiac symptoms, heart palpitations, heart arrhythmias, dizziness, fatique, physical weakness, difficulty concentrating, memory loss, learning problems, ABOUT (HTTPS://EHTRUST.ORG/ABOUT/) KEY ISSUES (HTTPS://EHTRUST.ORG/KEY-ISSUES/) ringing in the ears, headaches, and more. People report these symptoms immediately or shortly after smartmeters are installed and activated in their communities. Learn more about electrical POLICY (HTTPS://EHTRUST.ORG/POLICY) SCIENCE (HTTPS://EHTRUST.ORG/SCIENCE/) sensitivity and microwave sickness (https://ehtrust.org/science/electromagnetic-sensitivity/).

EDUCATE YOURSELF (HTTPS://EHTRUST.ORG/TAKE-ACTION/EDUCATE-YOURSELF/)

How do I get a smartmeter off my house? TAKE ACTION (HTTPS://EHTRUST:ORG/TAKE-ACTION/)

24 States have opt outs for smartmeters.

RESOURCES TO SHARE (HTTPS://EHTRUST.ORG/RESOURCES-TO-SHARE/) First, take a glance at your meter and see if you have a smartmeter or an analogue meter. Some people take a photo of the meter from a distance away from the meter so that instead they can MEDIA & PUBLICATIONS (HTTPS://EHTRUST.ORG/PUBLICATIONS/) look more closely at the photo. If your meter does not look like a digital meter, that is not a guarantee that it is not smart; contact your utility provider and ask (experienced citizens recommend that you do not explain why you are asking, simply ask *and* ask for the model name/number of your meter. If you do not have a smartmeter, find out if smartmeters are coming to your neighborhood by contacting a local smartmeter advocacy group or your utility provider. If you are not sure whether or not your meter is smart, if you have its model name/number, usually a local smartmeter advocacy group can tell you.

If you do have a smartmeter and you are in the United States, you can contact your utility provider and tell them you want your meter replaced with an analogue meter. Also send a letter via postal mail to your utility provider. Sometimes the provider's representative who answers the phone is not aware of this issue. We recommend locating the smartmeter advocacy group in your state working on this issue for full information on what you can do in your state and how you can best address this issue. To find the local smartmeter advocacy group in your area go to the EMF Safety Network webpage on global smartmeter groups (http://emfsafetynetwork.org/smartmeters/action-now/find-smart-meter-websites-in-your-area/)or StopSmartmeters local group directory (https://stopsmartmeters.org/frequently-asked-questions/contacts-database/).

The need for consumer choice.

People should have a right to choose whether or not they want a smartmeter at their home. Yet in many communities residents are told they have no choice and cannot refuse a meter. Or if residents are given an "opt out" they are required to pay monthly fees (in addition to the utility consumption charges) to keep the analogue meter. If you do not have any type of meter at your home (for example, some residents pay a flat fee for water) or have other questions about your options, you can find the local smartmeter advocacy group in your area at the EMF Safety

Network webpage on global smartmeter groups (http://emfsafetynetwork.org/smart-ABOUT (HTTPS://EHTRUST.ORG/ABOUT/) KEY ISSUES (HTTPS://EHTRUST.ORG/KEY-ISSUES/) meters/action-now/find-smart-meter-websites-in-your-area/)or StopSmartmeters local group directory (https://stopsmartmeters.org/frequently-asked-questions/contacts-database/) POLICY (HTTPS://EHTRUST.ORG/POLICY/) SCIENCE (HTTPS://EHTRUST.ORG/SCIENCE/)

EDUCATE YOURSELF (HTTPS://EHTRUST.ORG/TAKE-ACTION/EDUCATE-YOURSELF/) People are taking action in the US and worldwide so that citizens have consumer choice in regards to their utility meters, and there are groups formed in every area. Learn more at the TAKE ACTION (HTTPS://EHTRUST.ORG/TAKE-ACTION/) resources below this post.

RESOURCES TO SHARE (HTTPS://EHTRUST.ORG/RESOURCES-TO-SHARE/)

Communities and individuals have been successful in halting the smartmeter rollout in their MEDIA & PUBLICATIONS (HTTPS://EHTRUST.ORG/PUBLICATIONS/) area and getting analogue meters.

After community awareness was raised, some cities have enacted moratoriums on smartmeters. For example, the Santa Cruz Health Department

(http://library.constantcontact.com/download/get/file/1106306412269-

14/Santa+cruz+Co+letter+to+board+of+supervisors+1-24-12.pdf) **issued a report and the city has a Moratorium on smartmeters.** (http://files.ctctcdn.com/dee20059101/fcd257be-bd65-4e18-bb1c-41d7b7442de8.pdf)

Some individuals were initially told they must pay to "opt out" but were successful in getting these opt-out fees dropped after litigation. For example, you can read about Josh Hart's successful legal battle (https://stopsmartmeters.org/turn-on-the-electricity-drop-the-fees-psrec/#comment-1163201) here.

Expert Testimony On Smartmeters

Dr. David Carpenter's letter "Correcting the Gross Misinformation"

(https://maisonsaine.ca/actualites/smart-meters-correcting-the-gross-misinformation.html) PDF of Dr. Carpenter' Letter on smartmeters (https://ehtrust.org/wp-content/uploads/Carpenter-Letter.pdf)

Testimony on Smartmeters for Michigan Public Service Commission by (https://mipsc.force.com/sfc/servlet.shepherd/version/download/068t0000001UMnYAAW)**Dr. David Carpenter May 22 2015 (https://mi-** psc. force.com/sfc/servlet.shepherd/version/download/068t0000001UMnYAAW)"While smart ABOUT (HTTPS://EHTRUST.ORG/ABOUT/) KEY ISSUES (HTTPS://EHTRUST.ORG/KEY-ISSUES/) meters are too new for there to be human health studies 10 specifically on exposure from smart meters, there is a strong body of evidence 11 that demonstrates a variety of adverse human health effects, including cancer 12 and effects on brain and behavior, coming from exposure to radioficate Yours Eter (HTTPS://EHTRUST.ORG/POLICY) Dr. David Carpenter December 2011 Testimony to Michigan on Smartmeters (https://entrust.off.gatafequeres.//entrust.org/policy/)-dr-david-carpenter-with-exhibits.pdf) "Assessment of Radiofic equeres.//entrust.org/policy// -dr-david-carpenter-with-exhibits.pdf) "Assessment of Radiofic equeres.//entrust.org/publicAttes. (http://sagereports.com/smart-meter-rf/docs/Smart-Meter_Report.B-Tables.pdf) by Sage Assessment of Radiofic equeres. Dr. De Kun Li Testimony on Smartmeters and the lack of public health protection from FCC limits

(https://ecfsapi.fcc.gov/file/7022311506.pdf)

- Dr. De-Kun Li Testimonial Letter to FCC regarding electromagnetic radiation. https://ecfsapi.fcc.gov/file/7022311506.pdf (https://ecfsapi.fcc.gov/file/7022311506.pdf)
- Dr. De-Kun Li Testimony FCC- Docket2011-00262 https://ecfsapi.fcc.gov/file/7520940945.pdf (https://ecfsapi.fcc.gov/file/7520940945.pdf)

Dirty Electricity and Electrical Hypersensitivity: Five Case Studies by Magda Havas1 and David Stetzer World Health Organization Workshop on Electrical Hypersensitivity, 25-26 October, 2004 (https://ehtrust.org/wp-content/uploads/3.Havas_.StetzerWHODirtyElectricityStudies-E-7-Sub-1115.pdf)

BIOLOGICAL AND HEALTH EFFECTS OF MICROWAVE RADIO FREQUENCY TRANSMISSIONS A REVIEW OF THE RESEARCH LITERATURE A REPORT TO THE STAFF AND DIRECTORS OF THE EUGENE WATER AND ELECTRIC BOARD June 4, 2013 lead author Dr. Paul Dart, June 4, 2013 (https://olis.leg.state.or.us/liz/2013I1/Downloads/CommitteeMeetingDocument/42624)

Dr. Martin Pall Testimony: Health Effects of Wireless Massachusetts Statehouse 2017" June, 20, 2017, (https://ehtrust.org/wp-content/uploads/F0A37E38-356D-42BB-86F3-

1E6C50CABE83.pdf)Testimony given during a hearing on Massachusetts Senate Bill 1864: No Fee Opt Out for Smart Meters. (https://ehtrust.org/wp-content/uploads/F0A37E38-356D-42BB-86F3-1E6C50CABE83.pdf)

Dr. Conrad- Maine Public utilities Commission Testimony on Smart Meters. 2013. (http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2013/01/Exhibit-9-Conrad-Web.pdf) Dr. Andrew Marino Expert Testimony August 8, 2016 (http://andrewamarino.com/PDFs/testimony-ABOUT (HTTPS://EHTRUST.ORG/ABOUT/) AAM_Report.pdf) Magola & (HTTPS://EBTRUST.ORG/ABOUT/) ment S& (HTTPS://EHTRUST.ORG/KEY-ISSUES/) Magola & (Https://ehtrust.org/wp-content/uploads/Rebuttal-Testimony-Magda-revised-42-1.docx) EDUCATE YOURSELF (HTTPS://EHTRUST.ORG/TAKE-ACTION/EDUCATE-YOURSELF/) Health Department Resources on Smartmeters SafTak & AZTIHUM (HTTTPS://EHTRUST.ORG/TAKE-ACTION/) (http://library.constantcontact.com/download/get/file/1106306412269-14/RESQUE & FO & HARE (HTTPS://EHTRUST.ORG/R&SQUE & TO & SMartmeters. (http://files.ctctcdn.com/dee20059101/fcd257be-bd65-4e18-bb1c-41d7b7442de8.pdf) MEDIA & PUBLICATIONS (HTTPS://EHTRUST.ORG/PUBLICATIONS/) Published Research of Note

"Self-reporting of symptom development from exposure to radiofrequency fields of wireless smart meters in victoria, australia: a case series." (https://www.ncbi.nlm.nih.gov/pubmed/25478801)

"Review of some key studies, both recent and old (1971), reveals that the participants' symptoms were the same as those reported by people exposed to radiofrequency fields emitted by devices other than smart meters. Interestingly, the vast majority of Victorian cases did not state that they had been sufferers of electromagnetic hypersensitivity syndrome (EHS) prior to exposure to the wireless meters, which points to the possibility that smart meters may have unique characteristics that lower people's threshold for symptom development."

"It is a well documented 92 case series that is scientifically valid. It clearly demonstrates adverse health effects in the human population from smart meter emissions. The symptoms reported in this case series closely correlate not only with the clinical findings of environmental physicians, but also with the scientific literature. Many of the symptoms reported including fatigue, headaches, heart palpitations, dizziness and other symptoms have been shown to be triggered by electromagnetic field exposure under double blind, placebo controlled conditions. Symptoms in this case series also correlate with the Austrian Medical Association's Guidelines for the Diagnosis and Treatment of EMF Related Health Problems." American Academy of Environmental Medicine Letter (https://skyvisionsolutions.files.wordpress.com/2013/11/aaem-wireless-smart-meter-case-studies.pdf)

ABOUT (HTTPS://EHTRUST.ORG/ABOUT/) Daniel Hirsch SmartWeters	KEY ISSUES (HTTPS://EHTRUS	.org/key-issues/)			
POLICY (HTTPS://EHTRUST.ORG/POLICY/)	SCIENCE (HTTPS://EHTRUST.O	RG/SCIENCE/)			
EDUCATE YOURSELF (HTTPS://EHTRUST.ORG/TAKE-ACTION/EDUCATE-YOURSELF/)					
TAKE ACTION (HTTPS://EHTRUST.ORG/TAKE-ACTION/)					
RESOURCES TO SHARE (HTTPS://EHTRUST.ORG/RESOURCES-TO-SHARE/)					
MEDIA & PUBLICATIONS (HTTPS://EHTRUST.ORG/PUBLICATIONS/)					

Dr. Ronald Powell's Resources On Smartmeters

Ranking Electricity Meters for Risk to Health, Privacy, and Cyber Security

(https://www.scribd.com/doc/289782183/Ranking-Electricity-Meters-for-Risk-to-Health-Privacy-and-Cyber-Security)

Symptoms after Exposure to Smart Meter Radiation

(https://www.scribd.com/doc/289777267/Symptoms-after-Exposure-to-Smart-Meter-Radiation)

Symptoms Resulting from Exposure to Radiofrequency/Microwave Radiation from Smart Meters (https://www.scribd.com/doc/291507139/Symptoms-Resulting-from-Exposure-to-Radiofrequency-Microwave-Radiation-from-Smart-Meters)

The Health Argument for Replacing Wireless Smart Meters with a Safe Metering Technology in Maryland (https://www.scribd.com/doc/289787721/The-Health-Argument-for-Replacing-Wireless-Smart-Meters-with-a-Safe-Metering-Technology-in-Maryland)

A Ratepayer's View of Maryland's Bill of Rights for the Maryland Electric Power Companies that (https://www.scribd.com/doc/289781603/A-Ratepayer-s-View-of-Maryland-s-Bill-of-Rights-for-the-Maryland-Electric-Power-Companies-that-Implement-Wireless-Metering-Systems)

Implement Wireless Metering Systems (https://www.scribd.com/doc/289781603/A-Ratepayer-s-View-of-Maryland-s-Bill-of-Rights-for-the-Maryland-Electric-Power-Companies-that-Implement-Wireless-Metering-Systems)

You May Want to Ask Your Electric Power Company about Wireless Smart Meters (https://www.scribd.com/doc/289690072/Questions-You-May-Want-to-Ask-Your-Electric-Power-Company-about-Wireless-Smart-Meters) FCC Maximum Permissible Exposure Limits for Electromagnetic Radiation, as Applicable to ABOUT (HTTPS://EHTRUST.ORG/ABOUT/) KEY ISSUES (HTTPS://EHTRUST.ORG/KEY-ISSUES/) Smart Meters (https://www.scribd.com/doc/290090941/FCC-Maximum-Permissible-Exposure-Limits-for-Electromagnetic-Radiation-as-Applicable-to-Smart-Meters) POLICY (HTTPS://EHTRUST.ORG/POLICY/)

EDUCATE YOURSELF (HTTPS://EHTRUST.ORG/TAKE-ACTION/EDUCATE-YOURSELF/)

A desitional (Resources.org/take-action/)

Dr. PESOURCES TO SHARE (HTTPS://EHTBUST.ORG/RESOURCES-TO-SHARE/)

(https://maisonsaine.ca/actualites/smart-meters-correcting-the-gross-misinformation.html) MEDIA & PUBLICATIONS (HTTPS://EHTRUST.ORG/PUBLICATIONS/) Stop Smart Meters (https://stopsmartmeters.org/)

Smart Meter Education Network (http://www.smartmetereducationnetwork.com/),

EMFSafetyNetwork.org (http://emfsafetynetwork.org/)

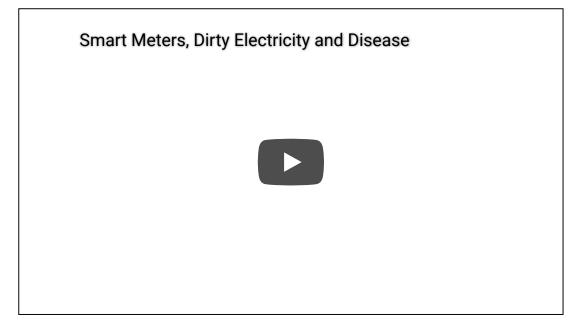
Michigan Stop Smart Meters (https://michiganstopsmartmeters.com/)

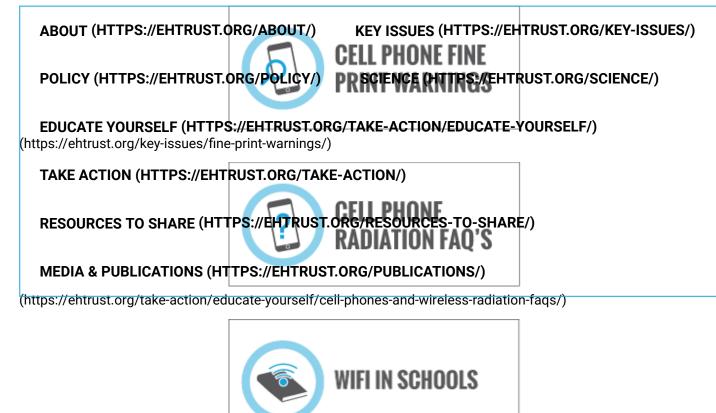
My Smart Meter Does What? (https://mysmartmeterdoeswhat.com/)

Maryland Smart Meter Awareness (https://smartgridawareness.org/)

Legal Cases And Documentation

Duke Energy Ohio Case (http://dis.puc.state.oh.us/CaseRecord.aspx?Caseno=14-1160&link=PDC)





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STORY AT-A-GLANCE

- The smart grid promised to enhance energy security and reduce energy usage. In reality,
 80 percent of households that have received a smart meter report increases on their utility
 bill
- > Thousands of people complain of health problems developing shortly after receiving a smart meter on their home. In some cases, blood tests confirm suspicions that RF radiation has impacted health
- > The smart grid is part of a clandestine surveillance network, violating privacy rights and posing an unprecedented cybersecurity problem

By Dr. Mercola

While largely unknown and rarely discussed, there's evidence to suggest a significant percentage of the diseases we now face is related to electromagnetic interference (EMI), so-called "dirty electricity," and **microwave radiation** from cellphones, routers, portable phones, smart meters and more. In a nutshell, these kinds of exposures impact your biology, specifically your **mitochondrial function**, which we've now come to appreciate is at the heart of virtually all chronic disease.

Sunlight is a natural or native form of electromagnetic frequency (EMF), and this type of **EMF exposure** is not only healthy but a vital part of maintaining healthy biology. Non-native or artificial EMF exposures, on the other hand, do quite a bit of harm. This includes:

- EMI, which is generated in the converter between AC and DC electricity
- Artificial light, such as fluorescent light bulbs, compact fluorescent lights and light emitting diodes (LEDs). Dr. Alexander Wunsch, a world class expert on photobiology, details many of the health hazards associated with LED lights, but the dirty electricity component is yet another reason to avoid these types of light bulbs in your home and office
- **Microwaves**, which includes not only your microwave oven but also cellphones, routers, portable phones, smart meters and more. These are particularly pernicious as they are pulsating fields

Take Back Your Power

The featured documentary, "Take Back Your Power," directed by Josh del Sol, investigates some of the problems associated with smart meters specifically. The issue came to his attention when a friend suddenly fell ill right after having a smart meter installed in her home.

Can microwave radio frequencies (RF) from smart meters really affect your health? And why are they being pushed so forcibly without public input? As shown in the film, utility company employees have literally broken into homes to forcibly install smart meters. These are just some of the questions del Sol decided to find the answers to. "Smart meters are part of a much bigger picture, a much bigger design," B. Blake Levitt, an award-winning science journalist, says. "The smart meter is just really the attachment that goes on the outside of a home or a business — a two-way transmission device that ties into the larger smart grid plans that are built out across the world."

I urge you to set aside the time this weekend to watch this excellent film. It's quite compelling, raising many important questions, and revealing just as many provocative answers.

Many are still unaware of the magnitude of the problem with RF radiation — not just from smart meters but also your cellphone and other wireless devices — and we simply cannot afford such widespread ignorance. Everyone's lives are at stake. Sticking our head in the sand will not be an option for much longer, considering the speed at which the world is being blanketed with wireless technologies.

The Smart Grid — A Massive Rip-Off Costing Taxpayers Billions

The smart grid promised to deliver enhanced energy security, greenhouse gas reductions, improved air quality and increased grid asset utilization. While this sounds good in theory, Levitt points out that there are many technical problems with the smart grid, and with the meters. Hundreds have caught fire. Most are installed by poorly trained employees without electrical degrees. Some have nothing more than a two-week training course under their belt.

Money, of course, is part of the equation. According to the film, some \$11 billion of taxpayers' monies have gone to fund the smart grid rollout. Estimates suggested building this grid could lead to a 4 percent reduction in energy usage by 2030, but real-world evidence shows smart meters result in no energy savings at all. According to a senior assistant to the attorney general for public utilities in Illinois, Susan Satter, "The report shows zero statistically different result in usage, compared to business as usual."

In fact, real-world evidence shows the smart grid has artificially raised energy usage, resulting in thousands of homeowners complaining of ludicrous overcharges. In one

instance, a homeowner's bill went from \$350 to more than \$1,100 in the month following the installation of a smart meter. The power company, PG & E, insisted the smart meter was working properly.

According to a survey by Toronto Hydro, 80 percent of homeowners with smart meters reported price increases on their bills, which is the exact opposite of what the smart grid promised to deliver. In a June 21, 2011, Chicago Tribune article, Illinois Attorney General Lisa Madigan wrote: "The utilities have shown no evidence of billions of dollars of benefits to consumers from these new meters, but they have shown they know how to profit. I think the only question is: How dumb do they think we are?"

Advertisement



Smart Grid Vulnerability and Privacy Concerns Galore

Security experts have also pointed out that the smart grid is vulnerable to a number of potentially catastrophic security breaches. Not only could hackers get into your home, they could bring down the entire electric grid of a nation. In other words, the smart grid poses an unprecedented cybersecurity problem.

Remarkably, energy officials were aware of these weaknesses yet gave the green light to go ahead anyway. According to U.S. Department of Energy Inspector General Gregory H. Friedman, "The initial weaknesses had not always been fully addressed, and did not include a number of security practices commonly recommended for federal government and industry systems." With a long list of potentially catastrophic consequences, why are private power companies pushing so hard for the installation of smart meters in every home? According to lan Crane, a British geopolitical researcher, the smart grid is part of a much bigger plan that involves the intimate tracking of people everywhere. In other words, it's part of a clandestine surveillance apparatus.

Each appliance in your home has a unique code, allowing the meter to collect data on the exact time you turn on a light, use the stove or anything else that happens inside your house. All of this energy usage data can then be used to create a profile of the residents living in the home. A Congressional research report, "Smart Meter Data: Privacy and Cybersecurity," published in February 2012, concluded smart meters are in fact a violation of the Fourth Amendment, noting that:

"In no uncertain terms the Court has asserted that [a]t the very core [of the Fourth Amendment] stands the right of a man to retreat into his own home and there be free from unreasonable government intrusion ...

With smart meters, police will have access to data that might be used to track residents' daily lives and routines while in their homes, including their eating, sleeping and showering habits, what appliances they use and when, and whether they prefer the television to the treadmill, among a host of other details."

Who Has Access to Your Energy Usage Data?

In California, power companies are already selling private energy usage data to third parties, says Joshua Hart, director of StopSmartMeters.org. According to former CIA director David Petraeus, the U.S. government has the ability to "spy on you through your dishwasher." Crane calls this "control freakery — the wet dream of the technocrats."

In 2012, it was revealed that Verizon has a patent for what's called "the smart TV detection zone" — a piece of technology capable of detecting sound and movement and making automatic recordings. With the addition of gesture recognition, facial recognition and voice recognition technologies, the TV is capable of determining who is in the room and what they're doing and saying at any given point in time.

Just where do we draw the line when it comes to this kind of technological intrusions into our private lives? As noted by Thomas A. Drake, former senior executive of the National Security Administration:

"What you're seeing is the establishment of a surveillance society; you're seeing the establishment of a surveillance network. It raises the specter of soft tyranny ... of automatic suspicion until we prove that you're not [guilty]; it raises the specter of universal wiretap[ping] ... and what happens if 'they' don't like you? ... That's not the country I took an oath to defend ..."

The smart grid is part and parcel of this clandestine surveillance network. And, as noted by former Apple executive, author and speaker, Jeffrey Armstrong, "There is no moral component to technology, unless humans insist that it be there." Interestingly, as noted in the film, the smart grid could be eliminated rather quickly if only inventions for alternative forms of energy were to be permitted to be developed and released.

Alas, U.S. law actually permits the government to suppress such technology, and with great ease at that. U.S. Code Title 35 of the patent law, Appendix L, allows the government to make secret any invention it believes might be "detrimental to the national security." So far, more than 5,000 different patents relating to alternative forms of energy production have been suppressed in this way, suggesting energy companies wield significant influence within our government (as do many other industries).

The U.S. is not the only nation where the energy industry reigns supreme. Spain raised many an eyebrow in 2013 when it decided to tax energy generated by privately owned solar panels.¹ Collecting sunlight for personal use and evading the tax could lead to significant fines.

Radiofrequency EMF = Possibly Carcinogenic to Humans

After investigating the issues surrounding the "why" of smart meters, del Sol dives into the claims of health effects reported after the installation of these devices.

In May 2011, the cancer research arm of the World Health Organization (WHO), the International Agency for Research on Cancer, classified radiofrequency EMF — such as that sent and received by smart meters — a class 2B carcinogen, meaning it is possibly carcinogenic to humans.² Utility companies claim the smart meters are only "on" for 45 to 60 seconds per day, when sending and receiving information — hardly enough to cause concern. But that's far from the whole story.

David Carpenter, director of the Institute for Health and the Environment (a collaborating center of the WHO) and professor of environmental health sciences at Albany School of Public Health in New York, is an expert on human health effects of environmental contaminants. "Under court order, Pacific Gas and Electric admitted that their smart meters generate 14,000 spikes of communication per day," Carpenter says.

He further explains that it doesn't matter how frequently the smart meter communicates with the utility company. What matters is how frequently they generate RF fields.

"Clearly, the utilities have been hiding the fact that these smart meters generate these radiofrequency fields almost continuously," he says. "They're pulses, but they're very, very frequent." In other words, while the smart meter is sending and receiving information for a total of about 60 seconds a day, the utility companies conveniently withheld the detail that these 60 seconds are not consecutive — they're split up into microsecond pulses that are emitted 24/7.

As technology progresses, the plan is for every single electrical household appliance and device to have a smart grid device embedded into it, such that it behaves like your cellphone. This way, each appliance and device will wirelessly transmit usage data to the smart meter located on the outside of your home, which in turn will transmit the data to the utility company via a receiving tower. Needless to say, this will exponentially increase RF exposure both inside and outside the home.

Health Effects Versus Public Safety Standards

Forty minutes into the film, del Sol reviews and summarizes some of the mounting scientific evidence showing RF microwaves do in fact have biological effects.

Measurements show a single smart meter has a power density of about 7.9 to 8.0 microwatts per centimeter squared (μ W/cm²) — FAR higher than the power density found to cause health effects such as:

- Headaches
- Altered calcium metabolism in the heart occurs at a power density of 2.5 $\mu W/cm^2$
- Changes in the hippocampus, affecting memory and learning, occur at 4.0 μ W/cm²
- DNA damage in cells occurs at 6.0 μW/cm²

I know it is highly unlikely you are currently familiar with these units. I hope you will watch my video below that shows a meter I use, which you can purchase if you like. I have two physician friends who purchased this meter and we all found hidden sources of microwaves in our homes. Fortunately, I have been able to find and remediate them, and my readings now rarely go above 0.010 μ W/cm². I also sleep in a Faraday cage, which gets the reading below 0.003 μ W/cm².

Despite the evidence showing serious health effects even at low levels, Switzerland has a safety standard of 9.5 μ W/cm², and China's, Poland's and Russia's safety standard is 10.0 μ W/cm² — the same level at which behavior has been altered after 30 minutes of exposure, causing "reflexes of avoidance." Banks of smart meters, such as those in apartment buildings, can emit power densities that are hundreds of times higher than those at which health effects have been found.

So, how can they get away with forcing these devices on everyone, you ask? The answer, del Sol says, is because Canada, the U.S. and several other developed countries have set the safety limit at 600 to 1,000 μ W/cm². "This so-called safety limit is literally tens of thousands of times higher than levels that are known to damage health," del Sol says.

Groundbreaking Research Reveals How Microwaves Biological Harm

More recent research³ by Dr. Martin Pall suggests the situation is even more dire than that. While evaluating studies showing you can radically reduce biological microwave damage using calcium channel blockers, Pall discovered a previously unknown mechanism of biological harm from microwaves emitted by cellphones and other wireless technologies.

Embedded in your cell membranes are voltage gated calcium channels (VGCCs). Turns out these VGCCs are activated by microwaves, and when that happens, about 1 million calcium ions per second are released. These ions stimulate the release of nitric oxide (NO) inside your cell and mitochondria, which combines with superoxide to form peroxynitrite, which in turn creates hydroxyl free radicals.

Hydroxyl free radicals are the most destructive free radicals known to man. They decimate mitochondrial and nuclear DNA, their membranes and proteins. The end result is mitochondrial dysfunction, which we now know is at the heart of most chronic disease. The tissues with the highest density of VGCCs are the brain, pacemaker in your heart and testes. So **Alzheimer's**, anxiety, depression, ADHA, **autism**, cardiac arrhythmias and infertility are direct results of excessive microwave exposure.

Pall has calculated that VGCCs are over 7 million times more sensitive to microwave radiation than the charged particles inside and outside the cell, which means the currently established safety standards for cellphones are off by a factor of over 7 MILLION.

This research explains why the argument that microwave radiation is not high enough to cause biological damage is fatally flawed. While the radiation does not cause thermal damage, it's still capable of causing massive biological damage by activating VGCCs in your cells, creating a cascade effect that results in hydroxyl free radicals being produced.

How Microwaves Affect Your Mood and Mental Health

Depression and **anxiety** have skyrocketed in recent years, and it's important to realize how your lifestyle is contributing to the problem. Based on the evidence, I now believe exposure to microwave radiation from cellphones, routers, cordless phones, smart meters and other wireless devices plays an important role in depression and anxiety.

The reason for this is because your brain is one of the organs with the highest density of VGCCs and when these VGCCs are stimulated by microwaves they release

neurotransmitters and neuroendocrine hormones. Others include your nerve tissue (like the pacemaker in your heart) and male testes, and cardiac arrhythmias, like atrial flutter or fibrillation and male infertility have also been linked to microwave radiation exposure.

Failure to realize this and take steps to minimize exposure will not only damage your DNA and increase your risk of most chronic illness; it will also seriously impair your body's ability to remove toxins, and significantly impair your immune response to address the large variety of pathogenic infectious assaults.

Take Control of Your Health — Avoid Unnecessary EMF Exposure

The take-home message is this: If you or someone you love struggles with a chronic health problem such as anxiety, depression, **dementia** or **cardiac arrhythmias** it would be wise to take whatever steps necessary to minimize your exposure to cellphones, portable phones, Wi-Fi routers, smart meters, wireless computers and tablets. You may also need to address other sources of **dirty electricity** in your home.

The relative rarity of brain cancer may lead you to believe that your cellphone and similar devices are safe. After all, when 91 percent of the adult population of the U.S. carries a cellphone⁴ and less than 0.02 percent⁵ develop a brain tumor, it may appear that using a cellphone is benign.

However, once you understand that the primary pathology behind cellphone damage is not related specifically to brain tumors (or even to cancer for that matter), but rather the mitochondrial damage caused by the reactive nitrogen species peroxynitrites, then the scope and potential for harm becomes quite clear.

Aside from depression and anxiety, the prevalence of which are rapidly rising, some 787,000 Americans die each year from **heart disease**,⁶ and mitochondrial dysfunction is a key factor. So, while you may not need to worry about developing a brain tumor from your phone, the risk of developing heart disease or dementia may be very real concerns.

I would strongly encourage you to invest in a microwave meter like the one I use and start exploring your home. Chances are you'll be shocked at what you and your family are being exposed to. Probably your biggest exposure is Wi-Fi, which is great since you can easily turn it off and hard wire from your cable modem. There are also devices that you can plug into your outlets and your modem that can allow you to hook up your computers without running new wires in your walls.

Blood Work Confirms Adverse Health Effects Following Smart Meter Installation

As noted by Dr. Dietrich Klinghardt in the film, blood testing reveals a number of measurable effects after the installation of smart meters. Observed symptoms include significant elevations in the inflammatory markers TGF-beta 1 and MMP-9.

Copper serum levels also rise, which is a sign of chronic inflammation, and hormones and neurotransmitter levels are adversely affected. "We have lab tests where we can show, here's a patient, I monitored him for 10 years before; he was completely normal. The smart meter was installed and six months later [he] looks like a dying patient, from the lab work," Klinghardt says.

Klinghardt goes on to state that in families where one spouse is feeling ill but not the other, lab tests reveal a decline in health is still occurring in both. Some are simply more in tune with their body and/or more sensitive to the effects, but everyone is affected nonetheless, and the blood work confirms this. Fifty-eight minutes into the film you can also see some fascinating footage using Darkfield microscopy, which shows how blood cells react in subjects standing 1 foot away from a smart meter for two minutes.

The cells are quite literally degrading, deforming and coming apart. Some of the damage seen is classic free radical damage, and as I just mentioned, the hydroxyl free radicals created when your VGCCs are exposed to microwaves are some of the most potent free radicals known to man. Here's an actual visual to go with that piece of information. The good news is, your body has the ability to recover once you remove the source causing the trauma, which in this case was a smart meter.

Grassroots Movements Fight Smart Meter Installations Across the US

Thousands of people report being harmed by their smart meters. Doctors report measurable health effects. The scientific literature reports distinct and in some cases serious health effects from RF, microwaves and dirty electricity. Yet utility companies keep pushing forward, without regard for public health, privacy or cybersafety.

Utility personnel are caught vandalizing and breaking into personal property to forcefully install smart meters, and in some cases the local police force has arrested homeowners refusing entry to their homes to have the meters installed. Where will it all end? Fortunately, a majority of U.S. states and Canadian provinces have active groups fighting back against this corporate tyranny.

Some municipalities have enacted moratoriums on smart meter installations. Others have new laws on the books that forbid smart meter installation without the homeowner's consent, and utility companies will be fined for forcibly installed smart meters. But utility companies are still charging forward. In some areas, the power company may insist you pay an opt-out fee, which is nothing short of extortion, since all you're doing is refusing physical harm.

It is, however, important to realize there is no legal obligation for you get a smart meter, but you have to be proactive in refusing it, or else they will simply install it — probably without you even knowing it.

If you discover that a smart meter has already been installed without your knowledge, you do have the right to demand it be changed back to the old monolog meter. If tens of thousands or millions of people refused to participate, the control system that is the smart grid would quickly collapse. As noted by Emmy Award-winning producer Jerry Day:

"You can't have radiation-emitting surveillance devices on everyone's home if people want to assert their rights. So, we're in a very strange time in history, where your power company, this innocent provider of electrical service, has become your assailant. And you are required, in order to protect yourself, to fight back. You're required to stand up and say, 'NO! This is wrong. I'm not going to permit it.'"

About the Director

I believe in bringing quality to my readers, which is why I wanted to share some information about the director, Josh del Sol, from "Take Back Your Power." We sat down with Josh to learn a little more about what goes in to making these films. Thank you to Josh for sharing with us.

What was your inspiration for making this film?

When "smart" meter installations started to ramp up in British Columbia, I kept reading about all kinds of privacy and health problems — especially from California. I reached kind of a tipping point when a good friend said how she got sick immediately when a meter was installed without her knowing. When she found out later about her meter change, she traced back and realized her symptoms started that same day and even hour.

At that point, I called a camera op friend, and said, "we've got to interview some of the people getting sick from these things!" I was rather dumbfounded that this could actually be happening under all of our noses, and was compelled to dig and verify the facts. As I learned about the other issues and risks, what I thought would be a 15-minute YouTube video evolved into a full-length feature, and the rest is history.

What was your favorite part of making this film?

I'd have to say the collaboration with Daryl Bennett — my editor, composer and post supervisor. The whole project was 2 years, start-to-finish. At the end of 12 months, I had all of this footage but no story — the intro I was trying to assemble was actually terrible. So, a week after being literally on my knees asking God to send a filmmaking partner, I meet Daryl. The next 10 months, we were on it four days a week.

Where do the proceeds to your film go?

Everything we have is going towards the "sequel" — which is actually a solutionsbased organization called InPower Movement. We're just about to launch a crowdfunding campaign, needed to get us over the finish line. I think many people paying attention, such as your readers, are now generally in a place of "corruption overwhelm." The need for root-level solutions is obvious.

Even those within the "1 percent" are beginning to wake up and realize that if society itself goes down, they go down. So, we're in it together — the human race, at this point. And equally obvious is that no one is going to swoop in and do it for us. So we need a tangible way to self-organize, get our game on and fix the problems for real. It's time.

We believe the InPower Movement will help resolve the root of the "smart" meter problem — which, like all such agendas, is money and corruption. We have seen some major indications of breakthrough with several of our pilot groups. We also believe the InPower strategy will then subsequently help resolve other major issues.

I honestly believe that the time of corporate tyranny will soon be over, as people find out how much potential power they actually have.

But as we do need help with completion funds, every crowdfunding donation and DVD purchase is helping to get the solution out sooner. Viewers can join out mailing list, receive a DVD and tap into our crowdfunding campaign at **www.inpowermovement.com**.

Click here to learn more about supporting InPower's IndieGogo Campaign

DR. STEPHEN SINATRA





Types of Arrhythmias

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By Stephen T. Sinatra, M.D., F.A.C.C., F.A.C.N., C.N.S., C.B.T.

Most of us take our heart's continual and steady beating for granted, that is, until our heart skips beats or starts to palpitate, or race. When our heart gets out of sync, either by pulsating in an irregular rhythm or suddenly speeding up, we're said to have an arrhythmia. An irregular heartbeat is one of the most common reasons people see cardiologists and may be benign or life threatening; one-third of all arrhythmias occur in normal hearts, and rarely are cause for concern.

Here are the basic types of arrhythmias, which I'll get into below:

- Atrial fibrillation, or "a-fib"
- Ectopic (skipped) heartbeats
- Premature heartbeats: PACs and PVCs
- Ventricular tachycardia
- Ventricular fibrillation, or "v-fib"

Understanding Arrhythmias

As long as you and your physician know what kind of arrhythmia you're dealing with, abnormal heartbeat changes are very treatable. If your heartbeat is abnormally high, and you're not exercising or emotionally upset, you are said to have tachycardia. If your heart rate slows to less than 50 beats per minute, you have bradycardia. A person who experiences both has brady-tachy syndrome.

• Atrial fibrillation

Sometimes referred to as "A-fib" or "AF", atrial fibrillation is the most common type of serious arrhythmia. A-fib occurs when the heart's upper two chambers (atria) do not contract in response to the pacemaker's electrical impulses; rather, they start reacting to various other electrical signals scattered throughout them. Think of being on a guided museum tour where you can't follow the tour guide because all the other tourists are shouting out directions and blocking your view. When the pacemaker is drowned out by other electrical signals, the atria do not forcefully contract and send blood into the ventricles to be pumped throughout the body. Instead, the atria "fibrillate," or start rapidly vibrating, which can cause heart rate to increase up to 250 beats per minute.

A person may feel the fibrillation as quivering, or may not feel it at all. Other signs of A-fib include dizziness, weakness, shortness of breath, or general flu-like symptoms. Most people can tolerate the high and/or low heartbeats of A-fib for temporary periods; however, when episodes last more than 24 hours or heart rate variance is extreme, the heart can experience considerable strain, which may lead to heart attacks or even congestive heart failure. Regular occurrences of A-fib can also increase a person's risk of stroke. Because blood is not forcibly contracted into the ventricles, but flows into them by virtue of gravity, it pools in the atria and the heart ultimately pumps less blood through the body. Eventually, clots may form on atrial walls, then break off and enter the arteries.

While A-fib does occur in healthy hearts, more often than not it is associated with heart disease. A-fib may be due to long-term high blood pressure, valvular disease, enlarged atria, or atria that do not contract properly. Malfunction of the heart's electrical conduction system due to age or metabolic states like hyperthyroidism can also lead to A-fib. Most people experience recurrent A-fib, meaning that their condition comes and goes. The primary goals in treating recurrent A-fib are to normalize heart rate and rhythm through various therapies and to prevent the formation of blood clots (see "Arrhythmia Treatments" below).

Ectopic heartbeats and premature heartbeats (PACs and PVCs)

Usually harmless, an ectopic beat is a skipped or extra heartbeat. Ectopic beats may occur for no apparent reason, or may be due to another issue such as an electrolyte imbalance in the blood, ischemia (lack of oxygen) caused by inadequate blood supply to the heart, or heart disease. Testing for ectopic beats is advisable in order to rule out other types of cardiac arrhythmias, though treatment is usually not necessary unless the irregular beats occur very frequently, are severe, or due to an underlying cause.

Premature heartbeats are extremely common, usually harmless, and may not cause any symptoms. If the premature beat occurs in the one of the top chambers of the heart it is a premature atrial contraction, or PAC. When in one of the ventricles, it is a premature

ventricular contraction, or PVC. While the PAC or PVC may feel like a "skipped" beat, it is occurring earlier than expected and is followed by a quick pause.

PACs and PVCs usually occur due to stress, use of stimulants (caffeine or other drugs) or alcohol, or low potassium states. They can be caused by heart conditions, though, such as lack of oxygen, mitral valve prolapse, or aging conduction systems. Most cardiologists will not prescribe drugs to treat premature heartbeats unless they are happening frequently and on a regular basis, and are accompanied by heart disease.

The next two types of arrhythmias can be deadly, and require immediate attention, especially in people who have experienced heart failure or whose heart muscles are inflamed, dilated, and don't pump well, or when their left ventricle is dilated.

• Ventricular tachycardia

Ventricular tachycardia, or "V-tach," characterizes an intense and prolonged racing of the heart and is like a runaway PVC. V-tach becomes dangerous if it lasts for more than a few seconds; it can also turn into ventricular fibrillation.

• Ventricular fibrillation

With ventricular fibrillation, or "V-fib," chaotic electrical signals throw the ventricles off rhythm and they begin to quiver or vibrate. This is very dangerous because when the ventricles do not forcibly contract, the heart can't supply itself and the rest of the body with life-sustaining blood. V-fib may occur during a heart attack or in a person whose heart is already weakened due to disease or another condition.

67



6 Natural Ways to Stop PVCs (Premature Ventricular Contractions)

In my days of active practice, one of the most common consultations I used to have was with patients who came in because they didn't feel like their hearts were beating properly anymore. Some described skipped beats. Others, ... Continue reading



Heart MD Institute - Dr. Stephen Sinatra's Informational Site

Causes of Arrhythmia

While changes in heart rate are a normal part of living, the pattern of electrical charges that maintain heartbeats can get easily thrown off. The following situations often lead to or exacerbate an arrhythmia, especially when chronic:

- More than just jitters: Caffeine overdose Depending on a person's sensitivity, drinking too much coffee, tea or caffeinated soda can trigger rapid or skipped heartbeats. A nervous system stimulant, caffeine also acts as a diuretic, and can contribute to magnesium deficiency, which may lead to arrhythmias.
- Electrolyte imbalances Low potassium and other electrolyte imbalances in the blood can also cause arrhythmias. As electrolytes such as potassium, magnesium, sodium help conduct electric charge through the body, a balance of them is necessary to ensure proper muscle contraction and nerve impulses. We lose electrolytes when we sweat (or suffer from chronic diarrhea) and have to replenish them through food, drinks or supplements.

- Sugar shock Eating too much sugar in one sitting can cause a person's insulin levels to surge, which can lead to electrolyte imbalance due to potassium deficiency. Too much chronic insulin release can also can cause arterial inflammation, as well as affect overall hormonal balance (including adrenal response). Researchers believe that oxidative stress and inflammation underlie AF because these problems affect localized electrical activity in atrial muscle tissue. Individuals with AF also have significantly higher levels of C-reactive protein (CRP), a marker of inflammation, in their blood.
- More stress than your heart can handle Like sugar overdose, stress overload can also disrupt hormonal balance, and cause the heart to continually beat faster while the body chronically operates on sympathetic nervous system overdrive. Stress is now considered a risk factor for hypertension and heart disease. Interestingly enough, more sudden deaths due to lethal arrhythmias or heart attacks occur on Mondays, as workers experience an "outpouring" of stress hormones as they gear up for work.
- Drugs and medications It's not just illegal stimulant drugs like cocaine which can cause your heart to beat irregularly, prescription drugs like Ritalin (methyphenidate), which prescribed to treat attention deficit hyperactivity disorder, tricyclic antidepressants and even birth control pills can disrupt heartbeat. Sometimes the drugs used to correct the arrhythmia, itself, such as digitalis and calcium channel blockers can worsen it. Over-the-counter cold medications and asthma sprays containing ephedrine or pseudoephedrine may also speed up or bring on a more forceful heart rate.
- Cigarette smoking A cardiovascular nightmare for several reasons, cigarettes also contain nicotine, a stimulant drug, which can cause a racing heartbeat. Quit, if you haven't already.
- Alcohol While many health experts agree that a glass of wine a day is a health mainstay, for people with arrhythmias, alcohol can exacerbate the situation. This is especially an issue during the holidays when people tend to mirthfully over-consume alcohol and food.

- Overeating and eating disorders Regular overeating, which can lead to overweight and obesity, can also increase risk of arrhythmias. Interleukin 6, a pro-inflammatory cytokine, is produced in fat tissue; hence people with excess body fat are more prone to low-grade systemic inflammation. Anorexia and bulimia are also associated with increased risk of ventricular arrhythmias.
- Chemical food additives As a rule of thumb, the more natural and simple ingredients in a food or drink product, the better. Chemical additives like monosodium glutamate (MSG), a form of glutamate added to food to make it tastier, are excitotoxins: they over stimulate brain neurons to the point of cell death. Not only do excitotoxins play a role in the development of depression, obesity and degenerative brain diseases like Alzheimer's, but they also contribute to strokes, especially in people who are magnesium-deficient.
- Environmental toxins Pesticides, herbicides, cadmium, lead, mercury, and aluminum are also excitotoxins. Exposure to mercury from vaccines, toxic fish or dental fillings and lead from paints, batteries and some drinking water can cause oxidative stress and poison enzyme systems. Toxins also tend to consume magnesium, an electrolyte which support healthy heart function and structural integrity. Air pollution has also been shown to increase stress response, which can increase risk of arrhythmia in people with pre-existing heart disease and abnormal heart rate variability.
- Electromagnetic fields (EMFs) Some radio frequency (RF) emissions are now known to directly affect heart rate. A recent study showed that exposure to cordless phone RF (and comparatively, WiFi) directly increased heart rate, even causing tachycardia, and increased sympathetic nervous system activity (adrenal response), as demonstrated by heart rate variability (HRV) measurements. Wireless RF emissions also suppress HRV.
 Grounding, or attuning to the Earth's natural electromagnetic potential, can counteract negative RF-related cardiac effects by balancing autonomic nervous system activity (as shown through improved HRV).

 Sudden strenuous exercise – "Warming up" for at least 10 minutes before exercising heavily allows your heart to gradually adjust to increasing activity. Sudden bursts of activity catch the heart off guard and can lead to palpitations. It's also important to engage in a 10-minute cool down after exercising, especially when exercising your legs. Mixing physical stress with competitiveness is another bad combination, so try to not get too emotionally invested in the outcome of whatever activity you're engaged in.

Diagnosing Arrhythmia

While some people recognize that something's not right with their heartbeat, others may be asymptomatic. If you notice a heartbeat irregularity or experience other cardiac symptoms like shortness of breath or chest pain, your physician can perform an echocardiogram (ECG or EKG) to test for arrhythmia and determine if it is serious, i.e. if heart muscle or valvular disease is at issue. Since palpitations not may occur during the actual EKG test, you may be instructed to wear a portable Holter monitor, which will record your heart rhythm during normal activities to demonstrate what type of arrhythmia you have and how frequently it is occurring.

Misdiagnosis happens, though, as chronic panic disorder (CPD) is often confused with arrhythmia. The recurrent episodes of fear and/or discomfort that characterize CPD can lead to excessive adrenaline release, and result in chest pain and heart palpitations. On a related note, EMF exposure may be an easily overlooked cause of arrhythmia; doctors need to start asking patients who experience irregular heartbeat about their use of cellular and cordless phones, wireless internet, baby monitors, etc.

Sinatra Solutions: Arrhythmia Treatments

The goal with arrhythmia treatments is to bring the heart back into rhythm. For otherwise healthy people with occasional bouts of arrhythmia, this can usually be accomplished through a few lifestyle changes: reducing stress, adding specific foods to the diet, and supplementing with a few key nutrients. People with more serious conditions like recurrent A-fib coupled with heart disease, ventricular tachycardia or ventricular fibrillation, may also require pharmaceutical and even surgical interventions. • Relax...

Uncontrolled emotional stress not only causes arrhythmias, but is linked to the development of many health problems including hypertension, type II diabetes and obesity. Have you ever heard the saying, "10 percent is circumstances and 90 percent is how you deal with them"? Learn to deal with day-by-day stressors in a healthy way by cultivating lifestyle habits that help you relax.

Mind-body therapies like yoga, meditation and Tai Chi are particularly helpful to train your mind to more calmly process seemingly stressful information. These therapies also encourage deep abdominal breathing, which is especially important for people with arrhythmias. Deep breathing improves HRV, which increases your ability to cope with stress while reducing your likelihood of experiencing a sudden cardiac event. Regular, moderate exercise is great for keeping stress at bay, and activities like playing with your pets or children, getting a massage, gardening, playing games, or engaging in some kind of creative project may also relax you. The trick is to, on a regular basis, generate more activity from the parasympathetic branch of your autonomic nervous system, and decrease sympathetic branch activity.

• Heart-smart eats

Cold-water fish like salmon, scrod, mackerel, sea trout and even sardines are great sources of omega-3 fatty acids, which have been shown in studies to protect against sudden cardiac death caused by lethal arrhythmias. Anti-inflammatory omega-3s also relax the smooth muscle in blood vessel walls to keep blood pressure low, and can help keep the blood thin. Make sure to avoid farm raised (look for "wild-caught") fish or fish that have otherwise been exposed to environmental pollutants like methyl mercury.

Consuming an abundance of dark, leafy greens like chlorophyll-rich kale and spinach can help prevent arrhythmias, as these veggies are full of magnesium. Magnesium, a mineral required for over 300 enzymatic reactions in the body, is also found in foods like avocados, almonds, pumpkin seeds, and whole grains. As low potassium levels can also cause arrhythmias, snacking on bananas, oranges, figs, and raisins, and incorporating more yogurt, whole grains and potatoes into your diet can help you get enough of this mineral important for electrolyte balance. A diet high in potassium is associated with lowered risk of stroke-related death.

In general, sticking to an anti-inflammatory diet most of the time supports cardiovascular health.

• Nutraceutical supports

Nutritional supplements that can help stabilize erratic heart rhythms include:

- Fish oil (2 to 4 grams daily) Just like fish, capsules of fish oil are full of antiinflammatory omega-3s.
- Coenzyme Q10 (100 to 300 mg daily) A sound intervention for arrhythmias, CoQ10 stabilizes membranes of the electrical conduction system. An antioxidant which helps protect against oxidative stress, CoQ10 also plays a crucial role in production of energy molecules (adenosine triphosphate, or ATP) that fuel heart function. For this reason alone, CoQ10 is probably the best supplement you can take for your heart. As a preventative and restorative nutrient, CoQ10 fights the heart disease which can mean the difference between a benign and malignant arrhythmia in many cases.
- L-carnitine (1 to 3 grams daily) Like CoQ10, L-carnitine assists in the production of ATP molecules which can prevent the heart from becoming diseased. As an antioxidant and vasodilator, L-carnitine is particularly helpful in the treatment of coronary artery disease: it helps deliver oxygen to blocked arteries and improves blood flow, while protecting against damage to the arterial lining.
- D-ribose (5 to 15 grams daily): Supplementing with D-ribose helps the body maintain a steady pool of ATP as reserve energy. This is particularly important when the body's

ability to recycle ATP is exceeded by overall ATP expenditure, which is at issue in people with heart disease and more chronic or otherwise serious arrhythmias. While the body makes ribose, extra may be needed if energy reserves are facing depletion.

- Magnesium (400 to 800 mg daily) Essential for healthy heart function, magnesium also helps the body generate ATP. Deficiency (less than 130 mg per day) can result in electrolyte imbalances that may cause ectopic heartbeats.
- Potassium (500 to 1,000 mg daily) Crucial for the overall functioning of nerves and muscles, potassium is particularly important for maintaining proper heart rhythms. A mineral that helps counteract the blood-pressure-raising effects of sodium, potassium helps relax smooth muscle in blood vessel walls. People who take diuretics are especially vulnerable to potassium deficiency, as are people who consume excess caffeine and/or alcohol. Note: people with kidney problems should not supplement with potassium.
- Hawthorn berry (500 mg, two to three times daily) An herb with powerful antioxidant qualities, hawthorn can enhance coronary circulation and increase cardiac energy levels, and is often prescribed as a substitute for digitalis, one of the most commonly ordered medications for improving contractibility in a weakened heart; people taking digitalis or other hypertensive medications should talk to their physicians before supplementing with hawthorn berry.
- Vitamin C (1,000 mg in divided doses with food) As a powerful antioxidant, vitamin C helps combat arterial inflammation (people with AF have much higher levels of CRP in their blood streams) and helps keep blood pressure down. People tend to become depleted in vitamin C when under a lot of psycho-emotional stress, which increases their risk of stroke-related death. Essential for tissue growth and repair, vitamin C also plays an important role in the proper utilization and absorption of calcium and iron; as too much vitamin C can bring about iron overload states, people with hemochromatosis or thalassemia major should be especially careful not to ingest more than 200 mg per day.

People with occasional AF, and with normal heart size and valve function are at lower risk of blood clots, and can usually manage the viscosity of their blood by taking natural blood thinning supports like:

- Fish oil (2 to 3 grams daily).
- Garlic (1 to 2 grams daily in capsule form, or ½ to one clove raw garlic per day) Not only is garlic a powerful antimicrobial agent (it can combat at least 23 different types of bacteria and 61 types of fungi) that helps to enhance the immune system, it is also a powerful anticoagulant; so much so, that it should not be taken in conjunction with oral anticoagulants like aspirin or Coumadin, or injectable agents like heparin. Garlic also has an ACE-inhibiting quality (ACE inhibitors are a class of antihypertensive drugs) and has been shown to help lower blood pressure.
- Nattokinase (100 mg daily) Nattokinase is an enzyme derived from fermented soybeans. It has powerful clot-busting and blood thinning potential. Nattokinase may be found in health food stores in supplement form.
- Limbrokinase (20 mg capsules taken on an empty stomach 1 time per day) Like nattokinase, lumbrokinase is an enzyme which helps prevent blood from forming and even helps dissolve existing clots.
- Vitamin E (200 to 300 IU) This fat-soluble anticoagulant and vasodilator helps reduce risk of heart attacks. As an antioxidant, it prevents damage to arterial lining and helps stabilize plaques. As there are 8 different types of vitamin E, it's best to supplement with a mixed tocopherol product that contains gamma-tocopherol and tocotrienols.
- Bromelain (600 mg) An enzyme derived from pineapple, bromelain helps keep blood viscosity at a healthy levels. Not just for heart health, bromelain also contains chemicals that interfere with the growth of tumor cells, and, as an anti-inflammatory agent, can help prevent or reduce joint pain and swelling.

Types of Arrhythmias | Heart MD Institute - Dr. Stephen Sinatra's Informational Site

Note: People taking Coumadin (warfarin) should consult their physicians before supplementing with blood thinning nutrients to avoid thinning the blood too much.

Pharmaceutical and Surgical Interventions

People with troublesome A-fib or ventricular arrhythmias are candidates for antiarrhythmic medications such as digoxin, which helps control ventricular contractions, calcium channel blockers, which can help regulate heartbeat, and beta blockers (Inderal, Lopressor, Corgard) which are used to control high heart rates. Other medications like Amiodarone, which relax heart muscle, may also be prescribed. Many of these drugs have a high rate of dangerous side effects, though, and can trigger arrhythmias and even sudden death. Natural treatments may be safer bets, unless patients are monitored in the hospital for negative side effects.

People who experience A-fib on occasion, and otherwise have healthy hearts, may benefit more from a hospital intervention known as electrical cardioversion. By sending a jolt of electricity into the atria through defibrillator paddles applied to the chest, this shock therapy helps reset a racing heart without risking side effects associated with antiarrhythmic drugs. Cardioversion is generally useful for people who have not been suffering from A-fib for more than six months.

As people with recurrent AF have to watch out for blood clotting, anticoagulation medications like Coumadin (warfarin) are usually warranted, especially if structural heart disease or other heart disease risk factors like family history, diabetes, leaky heart valves, or high blood pressure are present. While aspirin and natural blood thinning agents like fish oil, garlic, and nattokinase are effective blood thinners, they are not as effective as Coumadin.

In some cases, more invasive procedures may be necessary. Some patients with very slow heart rates may need a mechanical pacemaker implanted, as may patients with very high heart rates or heart rates which fluctuate between both extremes for whom medication has proved ineffective. Catheter ablation, another procedure which involves sending radio frequencies into the heart's electrical "problem areas" to stop abnormal rhythms in their tracks, may also useful, especially when repeated; a recent French study (Weerasooriya R, et al.) demonstrated that arrhythmia-free rates significantly increased in patients with whom the procedure was performed twice.

Patients with life-threatening arrhythmias like ventricular fibrillation and ventricular tachycardia, may benefit from an automated implantable cardioverter defibrillator (AICD) devices. Surgically implanted into a patient's abdominal wall, the AICD works like a "mini-defibrillator": based on a programmed limit, it senses when the heart is electrically overstimulated and fires an electrical discharge to break up the offending rhythm.

For more information on natural heart strengtheners, check out Lower Your Blood Pressure in Eight Weeks and The Sinatra Solution: Metabolic Cardiology.

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Leave a Reply

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Helen

on May 26, 2013 at 8:42 pm

Since I have A-fib I tried to enter the A-F program at Mass General Hosp. I was ineligible because I am "asymptomatic" whatever that means. My MGH cardiologist had referred me, but he doesn't want any longer to do echograms. Therefore I can't follow the health of my valves, the size of my heart chambers, or my ejection fraction #. This first-rate place is letting me down. Maybe I'll have to follow your latest publication about reversing deadly heart disease and treat myself as best I can. I may do something wrong, but neglect isn't right either. You explain a great deal, provide many benign choices. I take 12.5 mg metoprolol/day + 81 mg aspirin alt. days. A liver MD helps me fend off autoimmune hepatitis w/ Dr. Berkson's trio of antioxidents.

Matt

on July 30, 2013 at 12:34 am

I had recently purchased a handheld 3-lead ECG heart monitor and placed it on my mother. Much to our dismay, her ECG amplitude was very low. Her QRS mas more like a P wave. I talked her into taking Co-Q10, bought her a treadmill, and a case of bottled water. Three weeks down the road, we are as taken aback by the improvement as much as we were about the issue. Keep in mind that although we both have medical backgrounds, our experiment was not conducted in a lab and we do not have a control group. None the less, the before and after is undeniable and we believe that the combination of offering the heart something to do, good hydration as well as adding the Co-Q10 gave it the ability dramatically improve in both conductivity and efficiency.

Cecil Carver

on November 19, 2013 at 5:43 pm

•Environmental toxins – Pesticides, herbicides,. Would Agent Orange fall into this category to cause Arrhythmias and possibly later Sick Sinus Syndrome? If so would that be progressive over several years or an immediate affect? Thank you.

Sam S.

on November 22, 2013 at 4:38 pm

In mid September I ended up in the hospitalized and was diagnosed with AFib, I'm 62. Monday my mother, 86 was admitted to the hospital and was diagnosed with AFib. Last year my sisterin-law who lives in the house next door with my brother, mid 40s has been with heartrate problems and is currently still undiagnosed with no known cause. So 33% of the inhabitants of one house and 100% of those in the other. We have city water but, they've been digging up and replacing many of the old water lines due to holes in the pipes. This area has had a lot of industries, gas stations etc in the past and who knows what may have been dumped or leaked into the ground. What chemicals might cause issues and could be checked for in water samples? Coincidental?

HMDI Editor

on November 22, 2013 at 7:29 pm

Hi Sam, Do you live near a cell phone tower, or have wireless devices like Wi-Fi, **smart meters**, or cordless phones sending signals through your house? Cordless phones, which operate at the same frequency as Wi-Fi, have been shown to affect heart rate and/or rhythm – see http://www.heartmdinstitute.com/health-topics/emf-sensitivity/cell-phones-and-health/188-cell-phone-radiation-affects-brain-function – we suggest ditching the cordless phones and Wi-Fi for land lines and wired Internet and severely limiting use of cell phones. Try to avoid living near **smart meters** too. And yes, chemicals / environmental toxins can also lead to arrhythmias – see article above. Best of heath and happiness.

6 Holiday Gifts to Avoid or Use with Caution





Those of you who have been with me for a while know how concerned I am about electromagnetic radiation (EMRs). This colorless, odorless electro-pollution is all around us, in fact we're living in a sea of invisible EMRs. At the holidays, the problem only gets worse and manufacturers introduce even more wireless devices.

Here are six items you either want to keep off your holiday shopping list, or at least use with caution:

1. Video game systems. Wireless <u>video game systems</u> emit dangerous EMRs, even when the units are turned off. If you do choose to use Wi-Fi gaming systems, or buy them for children, make sure they're unplugged when not in use to minimize EMR exposure.

2. Wireless laptop computers and hand-held devices. Using wifi exposes you to EMRs. Instead of using wifi, plug your laptop into a wired internet connection. The same goes for wireless baby monitors—you want to use wired monitors instead. **3. Cell phones.** A panel from the World Health Organization (WHO) has released their findings that the microwave-type radiation from <u>cell phones</u> increases the long-term risk of developing brain tumors. This is huge and very important news—and confirms something I've been saying for years, that EMRs from cell phones are a danger.

If you buy a cell phone, skip the blue tooth device. Instead, buy a headset with rubber tubing which limits your EMR exposure. If you gift a cell phone to a child, teach them safe usage. Encourage them to text and use the speaker phone which limits their radiation exposure, and to carry their cell phone away from their body, such as in a backpack. It's also smart to use "airplane mode" as much as possible, and to use the cell phone only when necessary.

4. Microwave ovens. I'm often asked if <u>microwave ovens</u> are okay to use. My short answer is no, in fact I shun them because of the EMRs they emit. On numerous occasions over the years, I've checked other people's microwaves for leaks by using an inexpensive, handheld radiation meter. I get the same result every time: the meter goes wild. That's why no matter what the FDA says, it's impossible for me to watch the meter and believe we're safe. I prefer conventional stovetop cooking instead.

5. Cordless phones. <u>Cordless phone bases</u> are constantly emitting EMRs, even when they're not in use. It's like having a cell phone tower in your own home. You want to choose corded phones instead.

6. Electronic toys. Don't be fooled by slick toy marketing. Cell phone guidelines for safe use are based on a guidelines written for a 250 pound man with a big head. We know that our kids' heads <u>absorb twice as much microwave radiation</u> as any adult. Babies and toddlers are even more vulnerable. So, that colorful, educational-looking baby toy that contains a wifi device may be weakening your baby's protective brain barrier.

Also, if you allow your child to play games on devices like your cell phones and iPads, put them into airplane mode when you do. Plus, if you must use your cell phone to transmit, avoid doing that in close proximity to your children or grandchildren, like in the car where their developing bodies can get zapped with radiation.

You May Also Be Interested In

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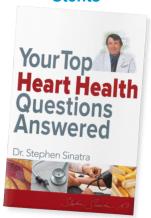
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Letter from Dr. De-Kun Li, MD, PhD, MPH

Kaiser Permanente Division of Research 2000 Broadway Oakland, CA 94612

Dear Ms. Martin:

Thank you for inviting me to provide my professional opinions on the SmartMeter safety issue. I will address two questions raised in the attached letter. But first, here is some background information:

1. Currently there are no national or international "**standards**" for safety levels of radiofrequency (a range of 3 kHz to 300 GHz) devices. What FCC is currently using are "guidelines" which have much lower certainty than a "standard". One can go to many governmental agencies' websites like NIOSH, EPA, FDA, etc. to verify this. Therefore, for anyone to claim that they meet "FCC" standards gives a false impression of safety certainty compared to "guidelines" which implies that a lot is "unknown."

2. The current FCC "guideline" was adopted by FCC based on EPA's recommendation in 1996. EPA made the recommendation "with certain reservation". There was a letter by Norbert Hankin, Center for Science and Risk Assessment, Radiation Protection Division at EPA describing the current FCC guidelines (The letter can be found through a Google search). According to Hankin's letter, the FCC current guidelines were solely based on "thermal effect" of radiofrequency, a level at which radiofrequency can cause heat injury. As we know, heat injury is not what the public is concerned about regarding radiofrequency safety. Their concerns are about cancer, miscarriages, birth defects, low semen quality, autoimmune disease, etc. Hankin's letter, specifically emphasized that the EPA recommended guidelines that FCC is currently using do not apply to non-thermal effects or mechanisms (e.g., cancer, birth defects, miscarriage, autoimmune diseases, etc) which are the focus of the public's concern. Hankin's letter states "Therefore, the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified."

3. In addition to being limited to only the thermal effect, the letter also states that the current FCC guidelines recommended by EPA were only based on experiments on animals in laboratories. Establishing firm safety standards

usually requires evidence from human studies such as epidemiological studies. The current FCC guidelines were based on animal studies only, not human data, which may explain why they are only considered as guidelines rather than standards. Furthermore, the thermal effect, used to establish the FCC guidelines, was based on *acute* thermal effect. It did not even deal with chronic long-term intermittent effect. In fact, Hankin's letter also states "exposures that comply with the FCC's guidelines generally have been presented as "safe" by many of the RF system operators and service providers who must comply with them, even though there is uncertainty about possible risk from nonthermal, intermittent exposures that may continues for years"

4. Electromagnetic fields (EMFs) can come from sources with a spectrum of frequencies. EMFs from electric power sources usually have a frequency less than 1 kHz, while radiofrequency (RF) generated by SmartMeters are reportedly in the range 900 MHz to 2.4 GHz. While overall research on the EMF health effect remains limited, there are more reported studies examining the EMF health effect in power line frequencies (< 1 kHz) including some of my research1-3 than in RF. It is not clear at this moment whether the findings on the EMF health effect at lower frequencies (i.e., < 1 kHz) can be applied to RF range. If the underlying mechanisms are similar, the findings in lower frequency EMFs can then be applied to RF range for SmartMeter. Many studies of power frequencies reported associations with childhood leukemia, miscarriage, poor semen quality, autoimmune diseases at a level much lower than those generating thermal damage as used by FCC.

5. Many chronic diseases that the public is concerned about (e.g., cancer) have a long latency period and take decades to show symptoms. Most wireless network and devices have only been used widely in the last 10 to 15 years. Therefore, many studies evaluating RF health effect related to cancer risk previously, if they failed to identify an adverse health effect, are not appropriate to be used as evidence to claim the safety of RF exposure since the latency period has not been long enough to show the effect even if an adverse association does indeed exist.

6. While the underlying mechanisms of the potential EMF health effect are not totally understood at present, skeptics have been focused on the EMF thermal effect, especially those who are NOT in the profession of biomedical research, such as physicists. It is now known that EMFs can interfere with the human body through multiple mechanisms. For example, it has been demonstrated that communication between cells depends on EMF signals, likely in a very low level. External EMFs could conceivably interfere with normal cell communication, thus disrupting normal cell differentiation and proliferation. Such disturbance could lead to miscarriage, birth defects, and cancer.

To address the two questions raised in the letter:

1. Whether FCC standards for SmartMeter are sufficiently protective of public health taking into account current exposure levels to radiofrequency and electromagnetic fields. First, FCC currently has only "guidelines", not standards as explained above. Second, as described in the background information above, the current FCC guidelines only deal with thermal effect, which was also based on animal studies only. Meeting the current FCC guidelines, in the best-case scenario, only means that one won't have heat damage from SmartMeter exposure. It says nothing about safety from the risk of many chronic diseases that the public is most concerned about such as cancer, miscarriage, birth defects, semen quality, autoimmune diseases, etc. Therefore, when it comes to non-thermal effects of RF, which is the most relevant effect for public concerns, FCC guidelines are irrelevant and can not be used for any claims of SmartMeter safety unless we are addressing heat damage.

2. Whether additional technology-specific standards are needed for SmartMeter and other devices that are commonly found in and around homes, to ensure adequate protection from adverse health effects. Safety standards for RF exposure related to non-thermal effects are urgently needed to protect the public from potential adverse health effects from RF exposure that are increasingly prevalent in our daily life due to installation of everpowerful wireless networks and devices like SmartMeter. Unfortunately scientific research is still lacking in this area and some endpoints like cancer take decades to study. The safety standards are not likely to be available anytime soon. The bottom line is that the safety level for RF exposure related to non-thermal effect is unknown at present and whoever claims that their device is safe regarding non-thermal effect is either ignorant or misleading.

In summary, we do not currently have scientific data to determine where the safe RF exposure level is regarding the non-thermal effect. Therefore, it

should be recognized that we are dealing with uncertainty now and most likely for the foreseeable future. The question for governmental agencies, especially those concerned with public health and safety, is that given the uncertainty, should we err on the side of safety and take the precautionary avoidance measures? Unknown does not mean safe. There are two unique features regarding SmartMeter exposure. First, because of mandatory installation, it is a universal exposure. Virtually every household is exposed. Second, it is an involuntary exposure. The public that are exposed to SmartMeters do not have any input in deciding whether they would like to have the SmartMeter installed. The installation is imposed upon the public. Governmental agencies for protecting public health and safety should be much more vigilant towards involuntary environmental exposures because governmental agencies are the only defense against such involuntary exposure. Given the uncertainty of the SmartMeter safety, one rational first step of public policy could be to require household consent before installation of SmartMeters. Finally, because of the nature of universal exposure, many susceptible and vulnerable populations including pregnant women and young children are unknowingly exposed 24 hours a day, 7 days a week. Usually, the threshold of harmful level is much lower for susceptible populations.

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De-Kun Li, MD, PhD, MPH, is a senior research scientist at the Division of Research, Kaiser Permanente Northern California.

Dr. Li completed his medical training and master's degree in public health at Shanghai Medical University, Shanghai, China. He then received his PhD in

epidemiology from the University of Washington, Seattle. Dr. Li has conducted research in the areas of pregnancy outcomes, sudden infant death syndrome, women's health, breast cancer, pharmacological effects on pregnancy outcomes, genetic etiology, and occupational exposures since 1984. His research interests include: reproductive, perinatal, and pediatric epidemiology, such as etiology of miscarriage, sudden infant death syndrome, preterm delivery, preelcampsia, low birth, infertility, cerebral palsy, birth defects, pediatric diseases (including childhood cancer and neurological disorders), autoimmune diseases in relation to maternal-fetal interaction, breast cancer, and risk factors for low semen quality. Dr. Li' research areas also include pharmacoepidemiolgical effect of medication use during pregnancy, genetic determinants of adverse pregnancy outcomes, the effect of electromagnetic fields on adverse pregnancy outcomes and low sperm quality, and the effect of endocrine disruptors, specifically Bisphenol A (BPA), on male and female reproductive systems. He is currently the associate editor of the American Journal of Epidemiology. Dr. Li has participated in a National Institute of Child Health and Human Development (NICHD) sponsored panel evaluation of "Back to Sleep" campaign and Sudden Infant Death Syndrome risk. He has also served as a member on the Ad Hoc Committee reviewing the NICHD program project, and on several Special Emphasis Panels at National Institute of Occupational Safety and Health and National Institute of Environmental Health and Sciences reviewing grant proposals. He has served as a member of the Policy Committee at the American College of Epidemiology. He was invited by the National Academy of Science to participate as a panel member in the U.S.-China Roundtable on Collaboration of Biomedical Research. In addition, he teaches at Stanford University and supervises doctoral students from the departments of epidemiology at UCB (University of California, Berkeley) and UCLA (University of California, Los Angeles).

Dr. Li has published extensively with 29 first-authored publications. He has obtained, as the principal investigator, numerous grants, ranging from \$600,000 to \$ 3.49 million from various federal agencies of the National Institutes of Health, as well as the California Public Health Foundation. Many of his publications have been widely reported by the national, international, and local news media including recent studies of caffeine intake and miscarriage, pacifier use and use of a fan in relation to SIDS risk, and depression during pregnancy and preterm delivery. Other examples of work receiving wide media coverage include the risk of miscarriage associated with EMF exposure, NSAID use and the risk of miscarriage, hot tub use during pregnancy and the risk of miscarriage, and maternal-fetal HLA compatibility and the risk of preterm delivery.

Current Position(s):

Research Scientist III, Division of Research, Kaiser Permanente Northern California

Lecturer, Stanford University, Department of Health Research and Policy **Primary Research Interests:**

Reproductive, prenatal, and pediatric epidemiology, such as etiology of infertility, miscarriage, preterm delivery, preeclampsia, sudden infant death syndrome, cerebral palsy, birth defects; pediatric diseases, including childhood cancer and neurological disorders; autoimmune diseases in relation to maternal-fetal interaction, and breast cancer.

Health effects of electromagnetic fields

Pharmacological effects of medication use during pregnancy on pregnancy outcome

Genetic determinants of pregnancy outcome

Risk factors for poor semen quality

Health effect of endocrine disruptors, especially Bisphenol A (BPA), on male and female reproductive systems

PRE-FILED TESTIMONY OF DE-KUN LI, MD, PhD, MPH MPUC Docket No. 2011-00262

- 1 Q. Please state your name and business address.
- 2 A. My name is De-Kun Li, MD, PhD, MPH. My address is:

3	Division of Research
4	Kaiser Foundation Research Institute
5	Kaiser Permanente
6	2000 Broadway
7	Oakland, CA 94612

- 8 Q. Briefly state your educational background and current employment.
- 9 A. I completed my medical training and a master's degree in public health at
 10 Shanghai Medical University (now part of Fudan University), Shanghai,
 11 China. I received my PhD in epidemiology from the University of
 12 Washington, Seattle.
- 13My current position is senior scientist (Research Scientist III, equivalent to14Full Professor) at the Division of Research, Kaiser Permanente Northern15California. I am also a faculty member in the Department of Health Research16& Policy of Stanford University. I have supervised doctoral students from17the departments of epidemiology at UCB (University of California,18Berkeley) and UCLA (University of California, Los Angeles).
- 19 Q. Briefly describe your professional experience.
- I am a reproductive and perinatal epidemiologist with extensive experience 20 A. conducting epidemiologic studies related to pregnancy outcomes and early 21 childhood diseases including miscarriage, preeclampsia, sudden infant 22 23 death syndrome (SIDS), birth defects, preterm delivery, low birthweight, 24 and childhood asthma and obesity. My recent research on environmental exposures during pregnancy has focused on Bisphenol-A (BPA) and 25 electromagnetic fields (EMF) and their impact on reproductive systems and 26 adverse pregnancy outcomes. I have published five papers on the health 27 effects of exposure to magnetic fields in peer-reviewed journals (see my 28 curriculum vitae, attached as Exhibit A). The two most recent articles 29 published in the Archives of Pediatrics and Adolescent Medicine (a JAMA 30 iournal) in 2011 and Scientific Reports (a Nature journal) in 2012 were 31 prospective studies examining the effect of maternal exposure to magnetic 32 fields during pregnancy on the risks of asthma and childhood obesity in 33

1 2		offspring during a follow-up period of 13 years. News coverage of the published papers can be obtained by a Google search of my name.
3		In addition to EMF health effects, my research areas include:
4 5	•	Health effects of endocrine disruptors, especially Bisphenol-A (BPA), on male and female reproductive systems
6 7	•	Pharmacological effects of medication use during pregnancy on pregnancy outcomes
8	•	Genetic determinants of pregnancy outcomes
9	•	Risk factors for poor semen quality
10 11 12 13 14	na aligare. Serenaida Anosenta	Risk factors for infertility, miscarriage, preterm delivery, preeclampsia, sudden infant death syndrome, cerebral palsy, birth defects, pediatric diseases, including childhood cancer and neurological disorders; autoimmune diseases in relation to maternal-fetal interaction, and breast cancer.
15 16	Q. Are you a member of any professional organizations or have other professional affiliations?	
17 18	A.	I am currently the associate editor of the American Journal of Epidemiology.
19 20 21 22 23	B. Construction Construction	
24 25 26	C.	I have also been invited by the <u>National Academy of Science</u> to be one of the panel members in the U.SChina Collaboration of Biomedical Research.
27 28 29 30 31	D.	I have been a member of many professional societies including: International Society of Environmental Epidemiology, Society for Epidemiological Research, American College of Epidemiology, Teratology Society, International Society for Pharmacoepidemiology, and Society of Public Health
32	Q. Have	you authored any papers or journal articles?

- 1 A. I have published extensively with more than 70 publications in peer – More importantly, I first-authored 36 of these 2 reviewed journals. 3 publications. Many of these publications have been widely reported and covered by national, international, and local news media including recent 4 studies of: 5 6 Maternal exposure to magnetic fields during pregnancy and the risks a. of childhood obesity and asthma in offspring during 13 years of 7 follow up 8 9 b. High level of exposure to magnetic fields and poor semen quality 10 Exposure to Bisphenol-A (BPA) and reduced male sexual function, c. 11 poor semen quality Exposure to BPA during pregnancy and increased risk of low 12 d. birthweight and mal-development of fetal genitalia 13 Caffeine intake during pregnancy and miscarriage risk 14 e. Pacifier use and use of a fan in relation to reduced SIDS risk 15 f. 16 Depression during pregnancy and preterm delivery. g. Have some research and epidemiological studies shown negative results for 17 Q. adverse health effects associated with RF exposure? 18
- My research has been focused on power-line frequency EMF exposure, not 19 A. RF EMF exposure. However, I am aware of the controversies about the 20 health effect of RF EMF exposure, mostly from cell phone-related 21 exposure, and reports of a potential increased risk of brain tumors 22 associated with long-term (> 10 years) use of cell phones. Although the 23 number of studies examining RF EMF health effect remains limited, the 24 existing reported studies are riddled with methodological problems. Chief 25 among them are retrospective designs [trying to ascertain RF EMF 26 exposure after outcomes (e.g., brain cancer) had already occurred], and 27 short term use of cell phone. Many of the outcomes examined (e.g., cancer) 28 have a long latency period and take decades to show symptoms. Thus, 29 those studies of short-term exposure which claim no effect on disease 30 outcomes that take a long time to develop are irrelevant in determining RF 31 EMF health effect. 32
- B. The science of understanding EMF health effects is still at an early stage.
 Like studying any other environmental risk factors, we will have to deal with the uncertainty of EMF safety for some time to come. Such

uncertainty means that nobody can make a definitive statement about RF EMF health effect, whether safe or not safe. In other words, while nobody can make a final conclusion about RF EMF adverse health effects, nobody can make a claim that RF EMF is safe either. Any such claim that RF EMF is safe is either ignorant or misleading.

C. Among the limited number of studies examining RF EMF health effect, they were almost exclusively focused on cell phone use. I am not aware of any studies conducted by any entities to demonstrate that use of the smart meter with massive installation in residential areas is safe for the human population.

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- Given the uncertainty about RF EMF health effects, the question becomes D. 11 whether it is the consumers responsibility to demonstrate the safety of a 12 product by being exposed to it and becoming a victim or casualty (e.g., 13 brain cancer); or the responsibility of the producer of smart meters to 14 demonstrate its safety before releasing it to the public. FDA requires 15 pharmaceutical companies to demonstrate that a new medication is safe 16 before it is allowed to be released on the market. Medications usually have 17 therapeutic value for patients and only those with certain conditions are 18 exposed to them (affected size is really small for most medications). For a 19 product like smart meters that almost everyone is exposed to, 20 demonstrating its safety is the paramount responsibility of the producer. 21
- 22 Q. Please describe your prospective epidemiological studies related to RF exposure.
- Over 13 years ago, we conducted a study to examine the health effect of 23 A. exposure to magnetic fields during pregnancy among more than 1,000 24 pregnant women. It was a prospective study, meaning magnetic exposure 25 was measured during pregnancy before the outcomes of interest occurred, 26 compared to many retrospective studies of RF EMF about cell phone use. 27 Our study was also based on objective measure of magnetic fields, meaning 28 that we asked participating women to wear a meter that captured magnetic 29 fields from all sources, rather than based on participant recall as in most RF 30 EMF studies of cell phone use. 31
- B. We first examined the health effect of magnetic fields on the risk of miscarriage. We published a paper in 2002 showing that women with higher exposure level to magnetic fields had almost twice the risk of miscarriage. The finding was widely reported by the international media at that time. BBC sent a reporting crew specifically to cover the story.
- 37 C. We then followed the offspring for up to 13 years. We published two
 38 papers, one in 2011 and another in 2012 reporting that children of mothers

who were exposed to higher levels of magnetic fields during pregnancy had a higher risk of childhood obesity and asthma (3-6 times higher in some cases). There was a dose-response relationship, meaning that the higher the maternal exposure level of magnetic fields was during pregnancy, the higher the risk of asthma or childhood obesity in their offspring. The papers were widely covered by the news media.

D. The important strengths of both findings are the prospective design and objective measure of exposure levels of magnetic field, both of which would lead to more accurate measure of magnetic field level. When magnetic fields were not measured correctly, like in those studies based on participants' recall, the resultant finding is "no adverse effect" due to what we call *non differential misclassification of exposure*.

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- Q. Are there plausible mechanisms by which non-thermal biological effects
 associated with RF exposure could result in cancer or other adverse health effects?
- Due to the limited research effort, the underlying mechanisms of the 15 A. potential EMF health effect are not totally understood at present. Skeptics 16 have been focused on the EMF thermal effect, especially those who are 17 NOT in the profession of biomedical research, such as physicists or 18 19 engineers. It is now known that EMFs can interfere with the human body through multiple mechanisms. For example, it has been demonstrated that 20 communication between cells depends on internal EMF signals, likely at a 21 very low level. External EMFs could conceivably interfere with normal 22 cell communication, thus disrupting normal cell differentiation and 23 24 proliferation. Such disturbance could interfere with fetal development and lead to miscarriage, birth defects, and cancer. However, demonstrating 25 such a mechanism will take time and effort through funded research. 26
- Q. In your opinion, does the state of the science support a public policy decision concluding that exposure to RF from wireless smart meters is safe?
- A. No. As stated above, at this point, the safety of RF EMF exposure is uncertain, largely due to a lack of research effort. Given the ubiquitous RF EMF exposure and its potential impact on large populations, the resources for studying RF EMF health effect are relatively limited. In fact, emerging reports, though still limited, are starting to show possible links to adverse health outcomes, especially with long-term exposure.
- B. I am not aware of any studies that have shown that exposure to smart meters is safe for the human population. Anyone who wants to install smart meters to every household needs to conduct studies to demonstrate that such massive installation is safe and will have no effect on the risk of

cancer, miscarriage, childhood obesity and asthma, autoimmune diseases, etc.

C. Exposure to smart meter RF EMF is different from exposure to cell phone RF EMF in several important ways:

> First, cell phone use is usually for a short duration. However, a smart meter, if installed near or outside the location within a residence that people are frequently occupying (such as bedrooms, living rooms, nurseries, etc.,) creates exposure to RF EMF that could last for many hours.

Use of cell phones is a voluntary exposure. One can choose not to use a cell phone. Vulnerable populations like infants and young children currently are not exposed to cell phone RF EMF in most cases. However, every resident, including infants, pregnant women and the fetus, in a household will be exposed to RF EMF from smart meters if installed nearby. Given that installation of smart meters is mandatory in most places, RF EMF exposure from smart meters is an "*involuntary*" exposure. Based on the principle of risk assessment, involuntary exposures require more stringent safety standards.

Because of the nature of involuntary exposure, many susceptible populations including pregnant women, young children, and those who are sensitive to RF EMF are being equally exposed. Susceptible populations usually have much lower thresholds of exposure level.

Dated this 3^{-1} day of December, 2012.

STATE OF CALIFORNIA ALAMEDA, ss:

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December 3, 2012

Personally appeared the above-named De-Kun Li, and stated under oath that the foregoing Affidavit made by him is true and based upon his own personal knowledge, information or belief, and so far as upon information and belief, he believes the information to be true. Before me, Jakow May May



A
Notary Public Attorney-at-Law
JEVERNY VALG
Name Typed or Printed
My Commission Expires: 0/20/2013

DE-KUN LI EXHIBIT A

Curriculum Vita

1. GENERAL INFORMATION

Name:De-Kun LiMailing Address:Division of ResearchKaiser Foundation Research InstituteKaiser Permanente2000 BroadwayOakland, CA 94612Telephone:510-891-3755Fax:510-891-3761Email Address:dkl@dor.kaiser.org

A. Education

1977- 82	Shanghai Medical University, Shanghai Major: Medicine	M.D.
1982- 85	Shanghai Medical University, Shanghai Major: Occupational Epidemiology	M.P.H.
1986- 93	University of Washington, Seattle, WA Major: Epidemiology	Ph.D.
1993-94	University of Washington, Seattle, WA Major: Environmental and Molecular Epidemiology	Postdoctoral Fellow

B. Professional experience

1993-98:	Investigator I (equivalent of assistant professor)
	Division of Research, Kaiser Permanente Medical Care Program, Oakland, CA
1998-2004	Investigator II (equivalent of associate professor)
	Division of Research, Kaiser Permanente Medical Care Program, Oakland, CA
2004-present	Investigator III (equivalent of full professor)
•	Division of Research, Kaiser Permanente Medical Care Program, Oakland, CA
2001-present	Visiting Professor
-	Shanghai Institute of Planned Parenthood Research
2005-	Lecturer
	Stanford University, Department of Health Research and Policy

C. Honors and awards

- 1987 Outstanding Student, School of Public Health, University of Washington
- 1989 Recipient of Senator Warren Magnuson Memorial Fellowship, National SIDS Foundation
- 1990 Participant of 1990 SER Student Workshop, Utah
- 1990 Recipient of the Young Investigator Travel Awards, Teratology Society
- 1991-92 Recipient of Gatzert Child Welfare Fellowship
- 1993 Recipient of the Young Investigator Travel Awards, Teratology Society
- 2007 Nominee for the board of directors of American College of Epidemiology

2. RESEARCH

A. Selected Publications

1. Peer-reviewed articles

- Li DK, Zhou QD, Qin XB, et al. An epidemiological study on the effect of N,N'-methylene-bis-(2-amino-1,3,4-thiadiazole)(MATDA) on outcomes of pregnancy. *Teratology* 1986;33:289-97.
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- Li DK, Checkoway H, Mueller BA. Electric blanket use during pregnancy in relation to the risk of congenital urinary tract anomalies among women with a history of subfertility. *Epidemiology* 1995;6:485-89
- Escobar GJ, Fischer A, Li, DK, Dremers R, Armstrong MA. Score for neonatal acute physiology: validation in three Kaiser Permanente neonatal intensive care units. *Pediatrics* 1995;96:918-22.
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- Ettinger B, Li, DK, Klein R. Continuation of postmenopausal hormone replacement therapy: Comparison of cyclic versus continuous combined schedules. *Menopause* 1996,4:185-9.
- Ettinger B, Li, DK, Klein R. Unexpected vaginal bleeding and associated gynecologic care in postmenopausal women using hormone replacement therapy: comparison of cyclic versus continuous combined schedules. *Fertil Steril* 1998;69:865-9
- Freedman JM, Li DK, Drasner K, Jaskela MC, Larsen B, Wi S. Transient neurologic symptoms after spinal anesthesia: an epidemiological study of 1.863 patients. *Anesthesiology* 1998;89:633-41.
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 Pinheiro S, Hammad T, Scott SE, Epstein RA, Jr., Arbogast, PG, Morrow JA, Dudley JA,
 Lawrence JM, Avalos LA, Cooper WO. Trends in the Use of Antiepileptic Drugs among
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Books, monographs, and chapters in books

Gao ES, Gu XY, Li DK. Evaluation of the focus of family planning program. In: Gao ES, Gu XY, Zhang XZ, eds. <u>Evaluation of Local Family Planning Program</u>. Beijing: Chinese Population Press, 1990; p. 31-43.

3. Letters in peer-reviewed publications

- Li DK, Daling JR, Hickok DE. Labor and Delivery Events and Risk of Sudden Infant Death Syndrome (SIDS) [Letter]. *Am J Epidemiol* 1992;135:585-6.
- Li DK, Weiss NS. Homicide and the Prevalence of Handguns: Canada and the United States, 1976 to 1980 [Letter]. *Am J Epidemiol* 1992;136:618.
- Li DK. Factors potentiating the risk of sudden infant death syndrome associated with the prone position [Letter]. *N Engl J Med* 1994; 330:63.
- Li DK. Reply to "prenatal exposure to sex hormones: a case-control study [Letter]. Teratology

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- Li DK, Neutra RR. Letter to the Editor: Magnetic fields and miscarriage. *Epidemiology*. 2002;13:237.
- Li DK, Neutra RR. Letter to the Editor: Magnetic fields and miscarriage-2. *Epidemiology*. 2002;13:372.
- Li DK, Liu L, Odouli R. Authors' Reply: Questions regarding methodological details. *BMJ*, August, 2003
- Li DK, Liu L, Odouli R. Authors' Reply: True risks or only suspicions. BMJ, 2004 328:108
- Neutra, R. R., Li D. "Magnetic fields and miscarriage: A commentary on Mezei et al., JESEE 2006." Journal of Exposure Science and Environmental Epidemiology 2008;18(6): 537-538.

B. Scientific and Professional Presentations and Abstracts

1. Invited meetings and presentations

- 1) NICHD panel evaluation of public campaign "Back to Sleep". 1997
- 2) Program evaluation and Lecture at the Department of Reproductive Epidemiology, Shanghai Institute of Planned Parenthood Research, 2001
- 3) NSAIDs Expert Advisory Board Member at Wyeth-Aerst Research, Wyeth Pharmaceutics, 2001
- 4) Expert Panel member for future research agenda on effect of magnetic fields exposure and the risk of miscarriage, Organized by Electric Power Research Institute, 2002
- 5) NCI Workshop on Early Reproductive Events and Breast Cancer. 2003
- 6) Session Chair and organizer <u>Quality of Reviews at NIH study sections</u> sponsored by American College of Epidemiology at the Congress of Epidemiology 2006, Seattle, 2006
- 7) Invited speaker at Department of Epidemiology, UCLA, June, 2007
- 8) Invited speaker at Department of Human Genetics, UCLA, March 2008
- 9) Invited speaker at Department of Environmental Health, University of Washington, April 2008.
- 10) Invited speaker at National SIDS Foundation annual meeting, March, 2009
- 11) Invited speaker at UCSF Residence Program, April, 2009
- 12) Invited speaker to be completed in 2010: the annual International Symposium on Environment and Hormones, New Orleans, October, 2010
- 13) Invited speaker: 50th Anniversary of Teratology Society, June 2010
- 14) Invited speaker: Dartmouth Medical School NIEHS Children's Environmental Health and Disease Prevention Center 2010

2. Presentations based on abstract submission

Li DK, Ferber J. Treatment Of Depression During Pregnancy And Its Effect On Infant <u>Nicu</u> Admission *International Society of Phamacoepidemiology Annual meeting*, Barcelona, Spain, 2012

- Li DK, Chen H, Odouli R. Maternal exposure to high magnetic fields during pregnancy and the risk of asthma in offspring. *International Society of Environmental Epidemiology Annual meeting*, Barcelona, Spain, 2011
- Li DK, Chen H, Odouli R. Maternal exposure to high magnetic fields during pregnancy and the risk of asthma in offspring. *Society for Perinatal and Pediatric Research (SPER)* annual meeting, Montreal, Canada, 2011
- Li DK, Zhou Z, Miao M, He Y, Wang J, Ferber JR, Herrinton LJ, Gao E, Yuan W. Urine Bisphenol-A (BPA) Level in Relation to Semen Quality. *International Society of Environmental Epidemiology a*nnual meeting, Seoul, South Korea, 2010
- Li DK, Zhou Z, Miao M, He Y, Wang J, Ferber JR, Herrinton LJ, Gao E, Yuan W. Urine Bisphenol-A (BPA) Level in Relation to Semen Quality. *Society for Perinatal and Pediatric Research (SPER)* annual meeting, Seattle, 2010
- Li D.K., MD, PhD, ZhiJun Zhou, MD, PhD, Maohua Miao, PhD, Yonghua He, PhD, Dandan Qing³, PhD, Tongjun Wu, MD, JinTao Wang, PhD, Xiaoping Weng, PhD, Jeannette Ferber¹, MPH, Lisa J. Herrinton, PhD, Qianxi Zhu, MD, ErSheng Gao MD, MPH, Wei Yuan, MD, PhD: *Urine Bisphenol-A Concentration and its Effect on the Risk of Male Sexual Dysfunction*. International Society of Environmental Epidemiology Annual meeting, Dublin, Ireland, 2009,
- Li DK, Bei Yan, Zheng Li, Eresheng Gao, MD, Maohua Miao, Dongming Gong, MD, XiaoPing Weng, Wei Yuan. Exposure to High Levels of Magnetic Fields and the Risk of Poor Sperm Quality. Later Breaker at the annual meeting of Society for Epidemiologic Research (SER), 2008
- Li DK, Weng X, Liu L, Odouli R. Caffeine intake during pregnancy and the risk of miscarriage: a population-based cohort study. Plenary presentation at Society for Pediatric and Perinatal Epidemiological Research (**SPER**), Seattle, 2006.
- Li DK, Liu L, Odouli R. Prenatal depression and its effect on the risk of preterm delivery. Plenary presentation at Society for Pediatric and Perinatal Epidemiological Research (**SPER**), Toronto, Canada, 2005.
- Li DK, Liu L, Odouli R. Prenatal Depression and its effect on the risk of low birthweight. Poster presentation at Society for Epidemiological Research (SER), Toronto, Canada, 2005.
- Li DK, Odouli R, Liu L, Vinson M, Trachtenberg E. Transmission of parentally shared human leukocyte antigen alleles and the risk of preterm delivery. Plenary presentation at Society for Pediatric and Perinatal Epidemiological Research (**SPER**), and poster presentation at Society for Epidemiological Research (**SER**), Salt Lake City, Utah, 2004.
- Li DK, Willinger M, Petitti DB, Odouli R, Vu H, Liu L, Hoffman HJ. Use of a Pacifier and the Risk of Sudden Infant Death Syndrome (SIDS). Plenary presentation at Society for Pediatric and Perinatal Epidemiological Research (**SPER**), and poster presentation at Society for Epidemiological Research (**SER**), Atlanta, Georgia, 2003.
- Li DK, Gao E, Wu J, Zhang Z, Liu L, Herrinton LJ. Induced Abortion (IA) and Breast Cancer Risk: A Population-based Study in China. Spotlight presentation at Society for Epidemiological Research (SER), Atlanta, Georgia, 2003.
- Li DK, Liu L, Odouli R. Prenatal NSAID use and the risk of miscarriage. BAY AREA CLINICAL

RESEARCH SYMPOSIUM. 2003

- Li DK, et al. Prenatal NSAID use and the risk of miscarriage. Plenary presentation at Society for Pediatric and Perinatal Epidemiological Research (**SPER**), and Spot Light presentation at Society for Epidemiological Research (**SER**), Palm Spring, California, 2002.
- Li DK, et al. Periconceptional Multivitamin Use and the Risk of Spontaneous Abortion. Oral presentation at Society for Pediatric Epidemiologic Research and Poster presentation at Society for Epidemiologic Research, Toronto, Canada, 2001
- Li DK et al. Hot Tub or Jacuzzi Use during Pregnancy and the Risk of Miscarriage. Poster presentation at Society for Epidemiologic Research and Society for Pediatric Epidemiologic Research, Toronto, Canada, 2001
- Li DK. A population-based prospective cohort study of personal exposure to magnetic fields during pregnancy and the risk of spontaneous abortion. Oral presentation at Society for Epidemiologic Research. Seattle, 2000
- Li DK. A population-based prospective cohort study of personal exposure to magnetic fields during pregnancy and the risk of spontaneous abortion. Oral presentation at Society for Pediatric and Prenatal Epidemiologic Research. Seattle, 2000
- Li DK Factors associated with a woman's decision to participate prenatal screen. Poster presentation at Society for Pediatric and Prenatal Epidemiologic Research. Seattle, 2000.
- Li DK Factors associated with a woman's decision to participate prenatal screen. Poster presentation at Society for Epidemiologic Research. Seattle, 2000.
- Li DK. Changing paternity and the risk of preeclampsia in the subsequent pregnancy. Society for Pediatric and Prenatal Epidemiologic Research. Chicago, June, 1998.
- Li DK. Changing paternity and the risk of preeclampsia in the subsequent pregnancy. Society for Epidemiologic Research. Chicago, June, 1998.
- Li DK. Changing paternity and the risk of preterm delivery in the subsequent pregnancy. Society for Pediatric and Prenatal Epidemiologic Research. Chicago, June, 1998.
- Li DK. Changing paternity and the risk of preterm delivery in the subsequent pregnancy. Society for Epidemiologic Research. Chicago, June, 1998.
- Li DK. Maternal preeclampsia during pregnancy and the risk of sudden infant death syndrome in offspring. The 5th International SIDS Conference. Rouen, France, April, 1998.
- Li DK, Wi S. *Recurrence of SIDS and infant deaths due to other causes* at VIIth International Congress on Sudden Infant Death Syndrome, Barcelona, Spain, May, 1997.
- Li DK, Wi S. Maternal placental abnormality and the risk of sudden infant death syndrome at VIIth International Congress on Sudden Infant Death Syndrome, Barcelona, Spain, May, 1997.
- Li DK. Maternal history of Subfertility and the risk of congenital urinary tract anomalies in offspring at 37th Teratology Society Annual Meeting, Palm Beach, Florida, June, 1997.
- Li DK, Checkoway H, Mueller BA. Electric blanket use during pregnancy in relation to the risk of congenital urinary tract anomalies among women with a history of subfertility. 1995 Teratology Society Annual Meeting. Newport Beach, California, June 25-28, 1995.
- Li DK, Mueller BA, Hickok DE, Daling JR, Fantel AG, Weiss NS. Maternal smoking during pregnancy in relation to the risk of congenital urinary tract anomalies. 1994 Teratology Society Annual Meeting. Las Croabas, Puerto Rico, June 24-27, 1994.

- Li DK, Daling JR, Hickok DE, Mueller BA, Fantel AG, Weiss NS. Oral contraceptive use after conception in relation to the risk of congenital urinary tract anomalies. Society for Epidemiologic Research 26th Annual Meeting. Keystone, Colorado, June 16-18, 1993.
- Li DK, Daling JR, Hickok DE, Mueller BA, Fantel AG, Weiss NS. Periconceptional multivitamin use in relation to the risk of congenital urinary tract anomalies. 1993 Teratology Society Annual Meeting. Tucson, Arizona, June 26-July 1, 1993.
- Li DK. The effect of prior fetal loss on the risk of SIDS associated with male offspring. Society for Epidemiologic Research 25th Annual Meeting. Minneapolis, Minnesota, June 10-13, 1992.
- Li DK, Daling JR. Biracial parentage in relation to the risk of SIDS. Society for Epidemiologic Research 24th Annual Meeting. Buffalo, New York, June 12-14, 1991.
- Li DK. The effect of parity on the relationship between a history of spontaneous fetal loss and the risk of SIDS in offspring. American Public Health Association 119th Annual Meeting. Atlanta, Georgia, November 10-14, 1991.
- Li DK, Spiers PS. Spontaneous abortion and reduced risk of SIDS in subsequent offspring. National Perinatal Association 1990 Annual Clinical Conference & Exposition in New Orleans.
- Li DK, Daling JR. Maternal smoking, low birthweight and race in relation to sudden infant death syndrome. 118 APHA Annual Meeting in New York City in October, 1990.
- Li DK. Risk factors for birth defects among Chinese children. The Teratology Society 13th Annual Meeting, Victoria, BC, Canada, 1990.
- Li DK, Daling JR, Weiss NS, Chu J, et al. Prior condom use and tubal pregnancy. 117th APHA Annual Meeting in Chicago in October, 1989.
- Li DK, Ni HY, Daling JR, Schwartz S. Secular change of birthweight among Southeast Asian refugees after immigration into the United States. 116th APHA Annual Meeting in Boston in Nov., 1988.
- Li DK, Xue SZ, Gu XQ, et al. An epidemiologic study on the effect of MATDA on pregnancy outcomes. Presented in the Second Symposium of Chinese Environmental Mutagen Society, Wuhan, China, Nov. 1984.

3. SERVICE

A. Service to the professional community

- 1) Committee member of Public Policy, American College of Epidemiology 2004-08
- 2) Associate Editor/Guess Editor, American Journal of Epidemiology, 1999-present
- 3) Member of the NIH NICHD Special Review Panel for Program Center grant: Perinatal Emphasis Research Centers, 1994
- 4) Member of the NIOSH Review Committee for OH-00-006 (R21) Program, 2000.
- 5) Member of the NIOSH Special Emphasis Panel Review for RFA (Endocrine Disrupters: Epidemiological Approaches), 2001.
- 6) Invited moderator for a Spotlight session on "Search for New Horizon to Improve Pregnancy outcomes" at 2003 annual meeting of Society for Epidemiological Research.

- 7) Invited by the Department of Epidemiology, School of Public Health and Community Medicine, University of Washington, to evaluate promotion of a faculty member to full professor. August, 2003.
- 8) Served as a reviewer for AJE, BMJ, Pediatric and Prenatal Epidemiology,
- 9) Invited by California Public Utility Commission to evaluate the legislative changes regarding EMF exposure requirement for construction of public schools.
- 10) Invited editorial board member of Open Epidemiology Journal
- 11) NIEHS study section, 2009
- 12) Member of Adversary Committee for Children's Environmental Health and Disease Prevention Research Center at Dartmouth, September, 2010

B. Service to governmental agencies

- U.S. National Committee for CODATA, Board on International Scientific Organizations, U.S. National Academy of Sciences AND Chinese National Committee for CODATA, International Cooperation Bureau, Chinese Academy of Sciences: Workshop on U.S.-China Collaboration on Health and Biomedical Research November, 2007
- U.S. National Committee for CODATA, Board on International Scientific Organizations, U.S. National Academy of Sciences, National Institutes of Health, AND Chinese National Committee for CODATA, International Cooperation Bureau, (f) Chinese Academy of Sciences: U.S.-China Roundtable on Collaboration of Biomedical Research, November, 2007
- 3) California Council on Science and Technology: Evaluation of the Safety Issues of Smart Meter, October 2010

Manuscript review:

Epidemiology American Journal of Public Health JAMA, BMJ European Journal of Epidemiology. Pediatric and Prenatal Epidemiology Journal of Pharmacoepidemiology Pediatrics Human Reproduction American Journal of Epidemiology

4. TEACHING:

- a. Lecture in the Department of Health Service, Stanford University.
- b. Supervise a doctorial student on dissertation at Johns Hopkins University
- c. Supervise students on their theses/dissertation at UC Berkeley

- d. Member of a committee for doctoral students at UC Berkeley
- e. Member of a committee for doctoral students at UCLA

5. EXAMPLES OF RECENT PUBLICATIONS THAT RECEIVED WIDE MEDIA COVERAGE

- a. Maternal exposure to high magnetic fields and the risk of asthma in offspring (2011)
- b. Use of ACE inhibitors in pregnancy and the risk of birth defects (2011)
- c. Urine BPA level and its adverse effect on semen quality
- d. BPA exposure and male sexual dysfunction
- e. Caffeine intake during pregnancy and the risk of miscarriage
- f. Use of a Fan and the Risk of SIDS
- g. Depression during pregnancy and the Risk of Preterm Delivery

Partial Listing of news coverage of study findings authored by Dr. De-Kun Li

National:

New York Times Wall Street Journal Washington Post Newsweek L.A Times All major Networks (ABC, NBC, CBS, Fox) **CNN Associated Press** National Public Ratio (NPR) Forbes Science News Scientific America Chicago Tribute **Bloomberg** News Reuters Univision TV Newsday Yahoo! News Excite.com NewsAlert.com EurekAlert.com ChamberBiz STLToday.com (St. Louis newspaper's site)

MyrtleBeachOnline.com SanLuisObispo.com HealthDay.com Doctor's Guide *WbMD*

International Press:

BBC News ITV (British TV Network, competes with BBC) Daily Record (Glasgow, Scotland) The Age (Australia) The Scotsman (Edinburgh, Scotland) Edinburgh Evening News (Scotland) The Independent Online (South Africa) ABC News Online (Australia) Brazilian newspaper: CORREIO BRAZILIENSE

Local media outlets:

San Francisco Chronicle San Jose Mercury News KQED KGO KBCS Seattle Times and Intelligencer Aberdeen American News (South Dakota) Philadelphia Inquirer Lexington (KY) Herald Leader Connecticut Post Tallahassee Democrat Columbus (GA) Ledger-Enquirer Wilkes-Barre (PA) Times-Leader KIRO-TV



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American Academy of Environmental Medicine

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January 19, 2012

Decision Proposed Decision of Commissioner Peevy (Mailed 11/22/2011) BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA On the proposed decision 11-03-014

Dear Commissioners:

The Board of the American Academy of Environmental Medicine opposes the installation of wireless "smart meters" in homes and schools based on a scientific assessment of the current medical literature (references available on request). Chronic exposure to wireless radiofrequency radiation is a preventable environmental hazard that is sufficiently well documented to warrant immediate preventative public health action.

As representatives of physician specialists in the field of environmental medicine, we have an obligation to urge precaution when sufficient scientific and medical evidence suggests health risks which can potentially affect large populations. The literature raises serious concern regarding the levels of radio frequency (RF - 3KHz - 300 GHz) or extremely low frequency (ELF - 300Hz) exposures produced by "smart meters" to warrant an immediate and complete moratorium on their use and deployment until further study can be performed. The board of the American Board of Environmental Medicine wishes to point out that existing FCC guidelines for RF safety that have been used to justify installation of "smart meters" only look at thermal tissue damage and are obsolete, since many modern studies show metabolic and genomic damage from RF and ELF exposures below the level of intensity which heats tissues. The FCC guidelines are therefore inadequate for use in establishing public health standards. More modern literature shows medically and biologically significant effects of RF and ELF at lower energy densities. These effects accumulate over time, which is an important consideration given the chronic nature of exposure from "smart meters". The current medical literature raises credible questions about genetic and cellular effects, hormonal effects, male fertility, blood/brain barrier damage and increased risk of certain types of cancers from RF or ELF levels similar to those emitted from "smart meters". Children are placed at particular risk for altered brain development, and impaired learning and behavior. Further, EMF/RF adds synergistic effects to the damage observed from a range of toxic chemicals. Given the widespread, chronic, and essentially inescapable ELF/RF exposure of everyone living near a "smart meter", the Board of the American Academy of Environmental Medicine finds it unacceptable from a public health standpoint to implement this technology until these serious medical concerns are resolved. We consider a moratorium on installation of wireless "smart meters" to be an issue of the highest importance.

The Board of the American Academy of Environmental Medicine also wishes to note that the US NIEHS National Toxicology Program in 1999 cited radiofrequency radiation as a potential carcinogen. Existing safety limits for pulsed RF were termed "not protective of public health" by the Radiofrequency Interagency Working Group (a federal interagency working group including the FDA, FCC, OSHA, the EPA and others). Emissions given off by "smart meters" have been *classified by the World Health Organization International Agency for Research on Cancer (IARC) as a Possible Human Carcinogen*.

Hence, we call for:

- An immediate moratorium on "smart meter" installation until these serious public health issues are resolved. Continuing with their installation would be extremely irresponsible.
- Modify the revised proposed decision to include hearings on health impact in the second proceedings, along with cost evaluation and community wide opt-out.
- Provide immediate relief to those requesting it and restore the analog meters.

Members of the Board American Academy of Environmental Medicine



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American Academy of Environmental Medicine Electromagnetic and Radiofrequency Fields Effect on Human Health

For over 50 years, the American Academy of Environmental Medicine (AAEM) has been studying and treating the effects of the environment on human health. In the last 20 years, our physicians began seeing patients who reported that electric power lines, televisions and other electrical devices caused a wide variety of symptoms. By the mid 1990's, it became clear that patients were adversely affected by electromagnetic fields and becoming more electrically sensitive. In the last five years with the advent of wireless devices, there has been a massive increase in radiofrequency (RF) exposure from wireless devices as well as reports of hypersensitivity and diseases related to electromagnetic field and RF exposure. Multiple studies correlate RF exposure with diseases such as cancer, neurological disease, reproductive disorders, immune dysfunction, and electromagnetic hypersensitivity.

The electromagnetic wave spectrum is divided into ionizing radiation such as ultraviolet and X-rays and non-ionizing radiation such as radiofrequency (RF), which includes WiFi, cell phones, and Smart Meter wireless communication. It has long been recognized that ionizing radiation can have a negative impact on health. However, the effects of non-ionizing radiation on human health recently have been seen. Discussions and research of non-ionizing radiation effects centers around thermal and non-thermal effects. According to the FCC and other regulatory agencies, only thermal effects are relevant regarding health implications and consequently, exposure limits are based on thermal effects only.¹

While it was practical to regulate thermal bioeffects, it was also stated that non-thermal effects are not well understood and no conclusive scientific evidence points to non-thermal based negative health effects.¹ Further arguments are made with respect to RF exposure from WiFi, cell towers and smart meters that

due to distance, exposure to these wavelengths are negligible.² However, many *in vitro, in vivo* and epidemiological studies demonstrate that significant harmful biological effects occur from non-thermal RF exposure and satisfy Hill's criteria of causality.³ Genetic damage, reproductive defects, cancer, neurological degeneration and nervous system dysfunction, immune system dysfunction, cognitive effects, protein and peptide damage, kidney damage, and developmental effects have all been reported in the peer-reviewed scientific literature.

Genotoxic effects from RF exposure, including studies of non-thermal levels of exposure, consistently and specifically show chromosomal instability, altered gene expression, gene mutations, DNA fragmentation and DNA structural breaks.⁴⁻¹¹ A statistically significant dose response effect was demonstrated by Maschevich *et al.*, who reported a linear increase in aneuploidy as a function of the Specific Absorption Rate(SAR) of RF exposure.¹¹ Genotoxic effects are documented to occur in neurons, blood lymphocytes, sperm, red blood cells, epithelial cells, hematopoietic tissue, lung cells and bone marrow. Adverse developmental effects due to non-thermal RF exposure have been shown with decreased litter size in mice from RF exposure well below safety standards.¹² The World Health Organization has classified RF emissions as a group 2 B carcinogen.¹³ Cellular telephone use in rural areas was also shown to be associated with an increased risk for malignant brain tumors.¹⁴

The fact that RF exposure causes neurological damage has been documented repeatedly. Increased blood-brain barrier permeability and oxidative damage, which are associated with brain cancer and neurodegenerative diseases, have been found.^{4,7,15-17} Nittby *et al.* demonstrated a statistically significant dose-response effect between non-thermal RF exposure and occurrence of albumin leak across the blood-brain barrier.¹⁵ Changes associated with degenerative neurological diseases such as Alzheimer's, Parkinson's and Amyotrophic Lateral Sclerosis (ALS) have been reported.^{4,10} Other neurological and cognitive disorders such as headaches, dizziness, tremors, decreased memory and attention, autonomic nervous system dysfunction, decreased reaction times, sleep disturbances and visual disruption have been reported to be statistically significant in multiple epidemiological studies with RF exposure occurring non-locally.¹⁸⁻²¹

Nephrotoxic effects from RF exposure also have been reported. A dose response effect was observed by Ingole and Ghosh in which RF exposure resulted in mild to extensive degenerative changes in chick embryo kidneys based on duration of RF exposure.²⁴ RF emissions have also been shown to cause isomeric changes in amino acids that can result in nephrotoxicity as well as hepatotoxicity.²⁵ Electromagnetic field (EMF) hypersensitivity has been documented in controlled and double blind studies with exposure to various EMF frequencies. Rea *et al.* demonstrated that under double blind placebo controlled conditions, 100% of subjects showed reproducible reactions to that frequency to which they were most sensitive.²² Pulsed electromagnetic frequencies were shown to consistently provoke neurological symptoms in a blinded subject while exposure to continuous frequencies did not.²³

Although these studies clearly show causality and disprove the claim that health effects from RF exposure are uncertain, there is another mechanism that proves electromagnetic frequencies, including radiofrequencies, can negatively impact human health. Government agencies and industry set safety standards based on the narrow scope of Newtonian or "classical" physics reasoning that the effects of atoms and molecules are confined in space and time. This model supports the theory that a mechanical force acts on a physical object and thus, long-range exposure to EMF and RF cannot have an impact on health if no significant heating occurs. However, this is an incomplete model. A quantum physics model is necessary to fully understand and appreciate how and why EMF and RF fields are harmful to humans.^{26,27} In quantum physics and quantum field theory, matter can behave as a particle or as a wave with wave-like properties. Matter and electromagnetic fields encompass quantum fields that fluctuate in space and time. These interactions can have long-range effects which cannot be shielded, are non-linear and by their quantum nature have uncertainty. Living systems, including the human body, interact with the magnetic vector potential component of an electromagnetic field such as the field near a toroidal coil.^{26,28,29} The magnetic vector potential is the coupling pathway between biological systems and electromagnetic fields.^{26,27} Once a patient's specific threshold of intensity has been exceeded, it is the frequency which triggers the patient's reactions.

Long range EMF or RF forces can act over large distances setting a biological system oscillating in phase with the frequency of the electromagnetic field so it adapts with consequences to other body systems. This also may produce an electromagnetic frequency imprint into the living system that can be long lasting.^{26,27,30} Research using objective instrumentation has shown that even passive resonant circuits can imprint a frequency into water and biological systems.³¹ These quantum electrodynamic effects do exist and may explain the adverse health effects seen with EMF and RF exposure. These EMF and RF quantum field effects have not been adequately studied and are not fully understood regarding human health. Because of the well documented studies showing adverse effects on health and the not fully understood quantum field effect, AAEM calls for exercising precaution with regard to EMF, RF and general frequency exposure. In an era when all society relies on the benefits of electronics, we must find ideas and technologies that do not disturb bodily function. It is clear that the human body uses electricity from the chemical bond to the nerve impulse and obviously this orderly sequence can be disturbed by an individual-specific electromagnetic frequency environment. Neighbors and whole communities are already exercising precaution, demanding abstention from wireless in their homes and businesses.

Furthermore, the AAEM asks for:

- An immediate caution on Smart Meter installation due to potentially harmful RF exposure.
- Accommodation for health considerations regarding EMF and RF exposure, including exposure to wireless Smart Meter technology.
- Independent studies to further understand the health effects from EMF and RF exposure.
- Recognition that electromagnetic hypersensitivity is a growing problem worldwide.
- Understanding and control of this electrical environmental bombardment for the protection of society.
- Consideration and independent research regarding the quantum effects of EMF and RF on human health.
- Use of safer technology, including for Smart Meters, such as hard-wiring, fiber optics or other non-harmful methods of data transmission.

Submitted by: Amy L. Dean, DO, William J. Rea, MD, Cyril W. Smith, PhD, Alvis L. Barrier, MD

Bibliography: Electromagnetic and Radiofrequency Fields Effect on Human Health

- California Council on Science and Technology. (Internet). (2011). Health Impacts of Radiofrequency Exposure from Smart Meters. Available from: <u>http://www.ccst.us/publications/2011/2011smartA.pdf</u>
- Electric Power Research Institute. (Internet). (2011). Radio-Frequency Exposure Levels from Smart Meters: A Case Study of One Model. Available from: <u>https://www.nvenergy.com/NVEnergize/documents/EPRI_1022270_caseStudy.pdf</u>
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- Phillips JL, Singh NP, Lai H. Electromagnetic fields and DNA damage. Pathophysiology. 2009; 16: 79-88.
- Ruediger HW. Genotoxic effects of radiofrequency electromagnetic fields. Pathophysiology. 2009; 16(2): 89-102.
- 7. Zhao T, Zou S, Knapp P. Exposure to cell phone radiation up-regulates apoptosis genes in primary cultures of neurons and astrocytes. Neurosci Lett. 2007; 412(1): 34-38.
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American Academy of Environmental Medicine Recommendations Regarding Electromagnetic and Radiofrequency Exposure

Physicians of the American Academy of Environmental Medicine recognize that patients are being adversely impacted by electromagnetic frequency (EMF) and radiofrequency (RF) fields and are becoming more electromagnetically sensitive.

The AAEM recommends that physicians consider patients' total electromagnetic exposure in their diagnosis and treatment, as well as recognition that electromagnetic and radiofrequency field exposure may be an underlying cause of a patient's disease process.

Based on double-blinded, placebo controlled research in humans,¹ medical conditions and disabilities that would more than likely benefit from avoiding electromagnetic and radiofrequency exposure include, but are not limited to:

- Neurological conditions such as paresthesias, somnolence, cephalgia, dizziness, unconsciousness, depression
- Musculoskeletal effects including pain, muscle tightness, spasm, fibrillation
- Heart disease and vascular effects including arrhythmia, tachycardia, flushing, edema
- Pulmonary conditions including chest tightness, dyspnea, decreased pulmonary function
- Gastrointestinal conditions including nausea, belching
- Ocular (burning)
- Oral (pressure in ears, tooth pain)
- Dermal (itching, burning, pain)
- Autonomic nervous system dysfunction (dysautonomia).

Based on numerous studies showing harmful biological effects from EMF and RF exposure, medical conditions and disabilities that would more than likely benefit from avoiding exposure include, but are not limited to:

- Neurodegenerative diseases (Parkinson's Disease, Alzheimer's Disease, and Amyotrophic Lateral Sclerosis).²⁻⁶
- Neurological conditions (Headaches, depression, sleep disruption, fatigue, dizziness, tremors, autonomic nervous system dysfunction, decreased memory, attention deficit disorder, anxiety, visual disruption).⁷⁻¹⁰
- Fetal abnormalities and pregnancy. ^{11,12}
- Genetic defects and cancer.^{2,3,13-19}
- Liver disease and genitourinary disease.^{12,20}

Because Smart Meters produce Radiofrequency emissions, it is recommended that patients with the above conditions and disabilities be accommodated to protect their health. The AAEM recommends: that no Smart Meters be on these patients' homes, that Smart Meters be removed within a reasonable distance of patients' homes depending on the patients' perception and/or symptoms, and that no collection meters be placed near patients' homes depending on patients' perception and/or symptoms.

Submitted by: Amy L. Dean, DO and William J. Rea, MD

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