PRECISION PUBLIC HEALTH :
CURRENT AND FUTURE LANDSCAPE

NEW PRECISION PARADIGM

Image credit: Centers for Disease Control

PRECISION MEDICINE

An emerging approach for disease prevention and treatment that takes into account people's **individual** variations in genes, environment and lifestyle
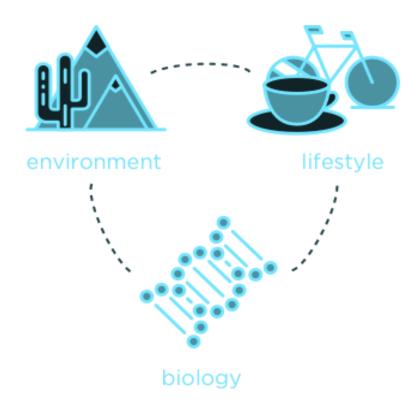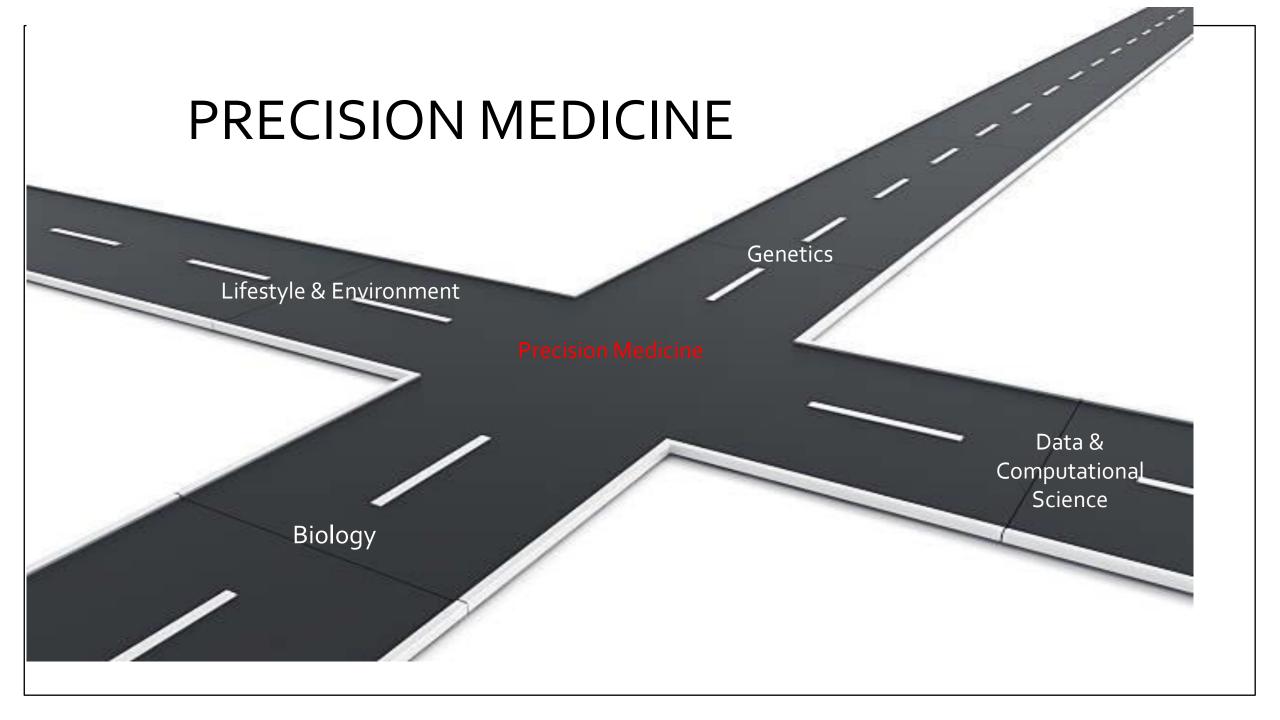

environment

lifestyle

biology

PRECISION MEDICINE

Lifestyle & Environment

Genetics

Precision Medicine

Biology

Data & Computational Science

PRECISION MEDICINE INITATIVE 2015

Perspective

A New Initiative on Precision Medicine

Francis S. Collins, M.D., Ph.D., and Harold Varmus, M.D.
N Engl J Med 2015; 372:793-795 | February 26, 2015 | DOI: 10.1056/NEJMp1500523

💬 Comments open through March 4, 2015

Article	References	Citing Articles (1082)	Comments (7)	Metrics

"Tonight, I'm launching a new Precision Medicine Initiative to bring us closer to curing diseases like cancer and diabetes — and to give all of us access to the personalized information we need to keep ourselves and our families healthier."

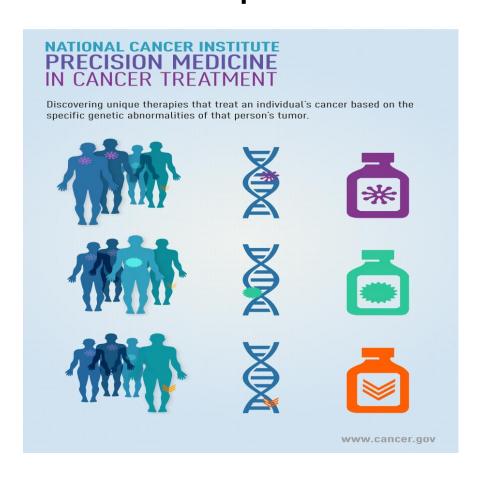— President Barack Obama, State of the Union Address, January 20, 2015

President Obama has long expressed a strong conviction that science offers great potential for improving health. Now, the President has announced a research initiative that aims to accelerate progress toward a new era of precision medicine (www.whitehouse.gov/precisionmedicine). We believe that the time is right for this visionary initiative, and the National Institutes of Health (NIH) and other partners will work to achieve this vision.

The concept of precision medicine — prevention and treatment strategies that take individual variability into account — is not new[1]; blood typing, for instance, has been used to guide blood transfusions for more than a century applying this concept broadly has been dramatically improved by the recent

"The right intervention, to the right patient at the right time- every time"-
Barack Obama
2015 State of Union Address

PRECISION MEDICINE INITATIVE:
Two Components: Cancer & National Cohort

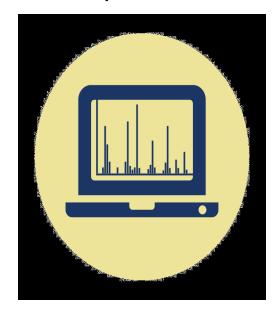*The All of Us Research Program seeks to build a national research cohort of 1M+ U.S. participants.*

Many factors have converged to make now the right time to begin a program of this scale and scope.
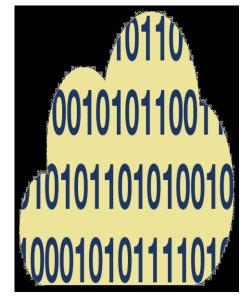
WHY NOW?
DRIVERS OF PRECISION

- Reduced cost to sequence human genome

- Improved technologies for biomedical analysis

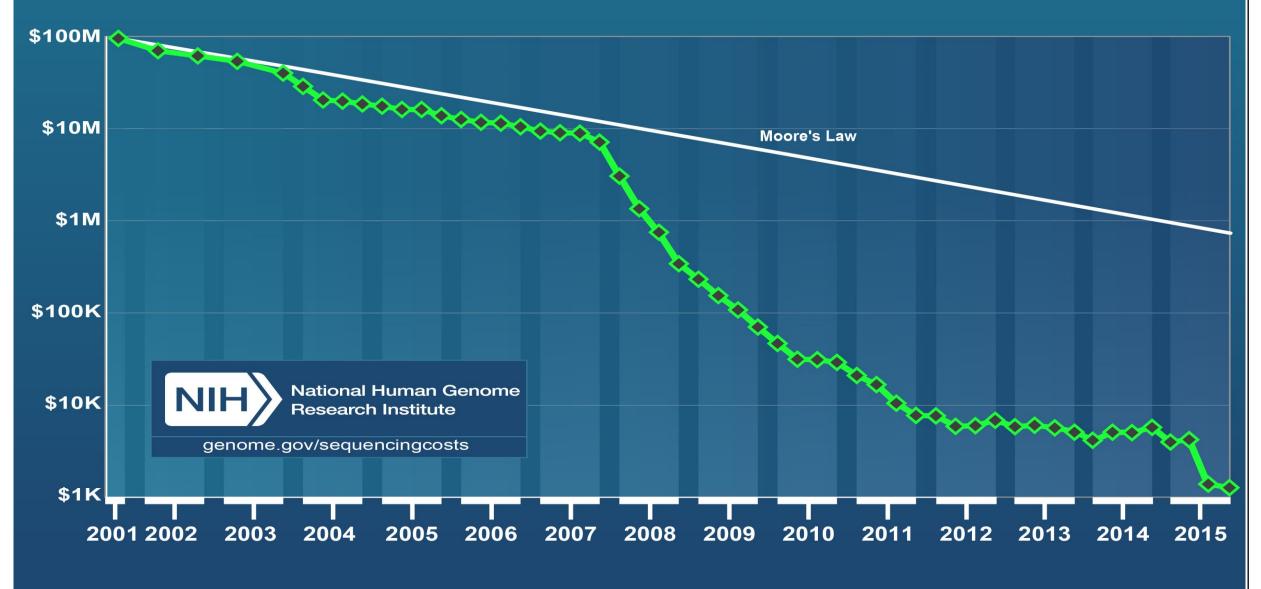- New data science tools to analyze large datasets

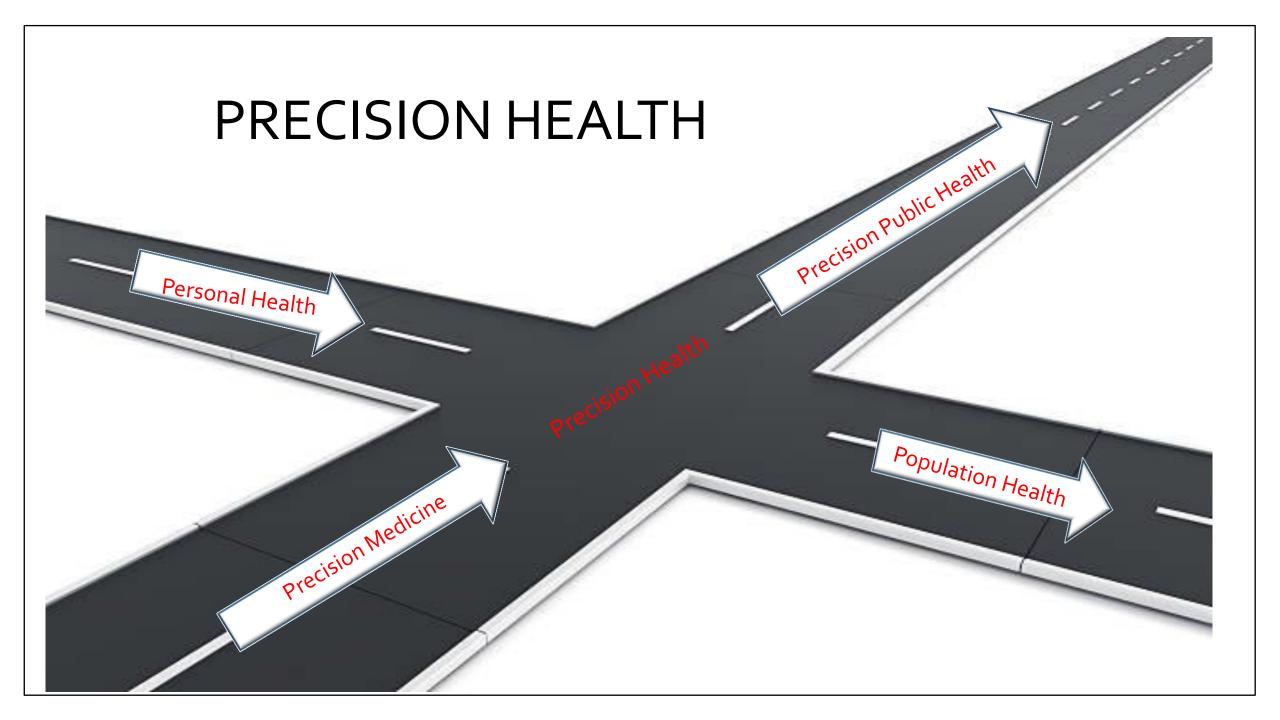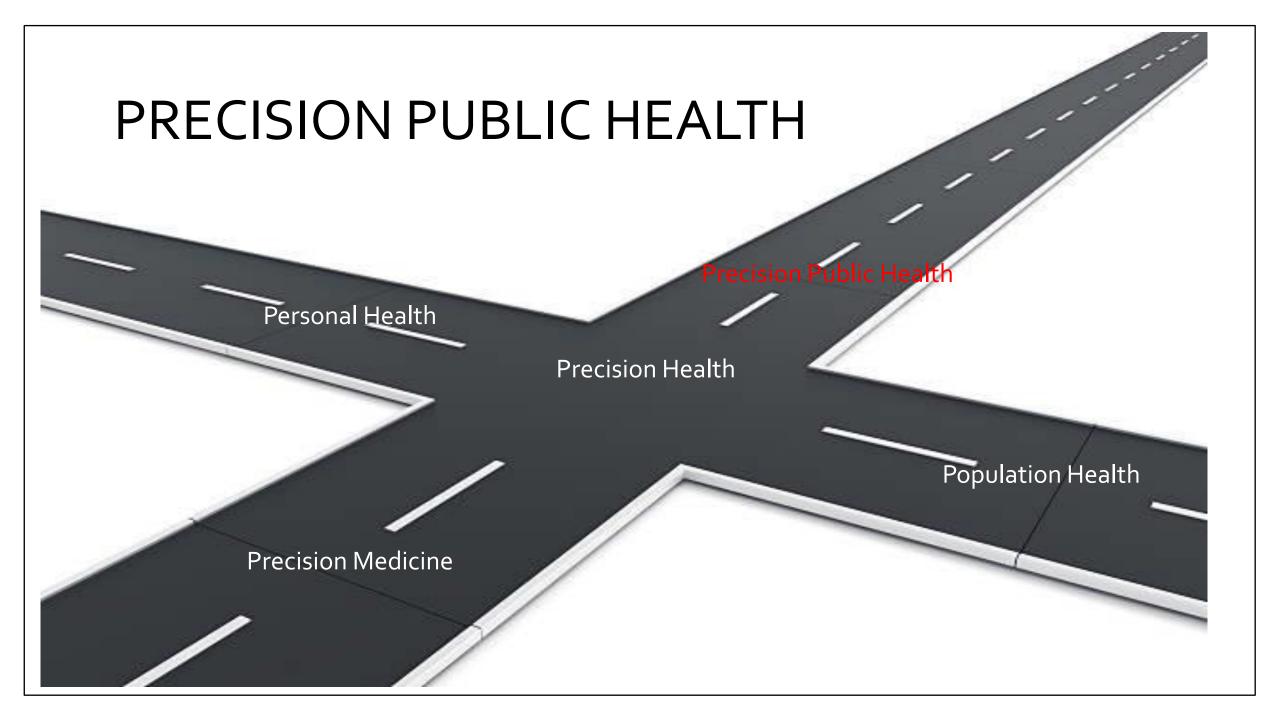- Necessity to reduce costs

PRECISION HEALTH

Personal Health

Precision Public Health

Precision Health

Precision Medicine

Population Health

PRECISION HEALTH

Predict

Prevent

Personalize

PRECISION ORAL HEALTH PLAN

PRECISION PUBLIC HEALTH

PRECISION PUBLIC HEALTH THOUGHT LEADERS

Precision public health is characterized by discovering, validating, and optimizing care strategies for well-characterized population strata- 2016

Using data to guide interventions that benefit populations more efficiently is a strategy we call precision public health- 2016

Precision in the context of public health can be simply described as improving the ability to prevent disease, promote health and reduce health disparities in populations

Dr. Arnett

Dr. Desmond-Hellman

Dr. Khoury

INTERVENTION COMPONENTS

1. Identify and Collect Data to Define At-Risk Subgroups

- Health-related (EHR, sensors, genetic)

- Geography (Zip-code, Census Tract)

- Surveillance (Disease Burden, Healthcare Utilization, Clinical/Laboratory)

- Determinants of Health (Social & Environmental)

- Demography (Age, Race, Ethnicity)

PRECISION PUBLIC HEALTH LIBRARY GUIDE
http://guides.uflib.ufl.edu/precisionpublichealth

Selection Criteria:

Federal, State of Florida or University of Florida data sources that could be applied to public health research in Alachua County

- Annotated and maintained by Health Science Center librarians

- Organized by Topic and Jurisdiction

Agricultural

CDC: National Health and Nutrition Examination Survey

UF/IFAS SOLUTIONS — Institute of Food and Agricultural Sciences

Demographic

Community Health Status Indicators

US Census Bureau

Environment

Florida Environmental Public Health Tracking

USGS — GWIS

Health Statistics

BEBR — Bureau of Economic and Business Research Institute

CDC
- The National Center for Health Statistics
- National Vital Statistics System

FLHealthCHARTS — Florida Charts

Florida HEALTH — Florida Department of Health

Clinical Data

i2b2 — Informatics for Integrating Biology and the Bedside

Community Health Resources

astho — Association of State and Territorial Health Officials Community Health Needs Assessments

HealthStreet — Health Street

OneFlorida Clinical Research Consortium — One Florida Clinical Research Consortium Data Trust

Disease/Condition Surveillance

CDC
- Behavioral Risk Factor Surveillance System
- National Health Interview Survey
- National Health and Nutrition Examination Survey

Florida HEALTH — Florida Cancer Data System.

FGDL — Florida Geographic Data Library

Florida Shots — Florida Shots

SEER — The Surveillance, Epidemiology, and End Results

Health Services/ Administration

AHRQ — Agency for Health Care Administration Area Health Resource Files

HRSA

THE HENRY J. KAISER FAMILY FOUNDATION — Kaiser Family Foundation

CDC — National Health Care Surveys

RWJF — State Health Access Data Assistance Center

Housing

United States Census Bureau — American Housing Survey

Legal/Law Enforcement/Crime
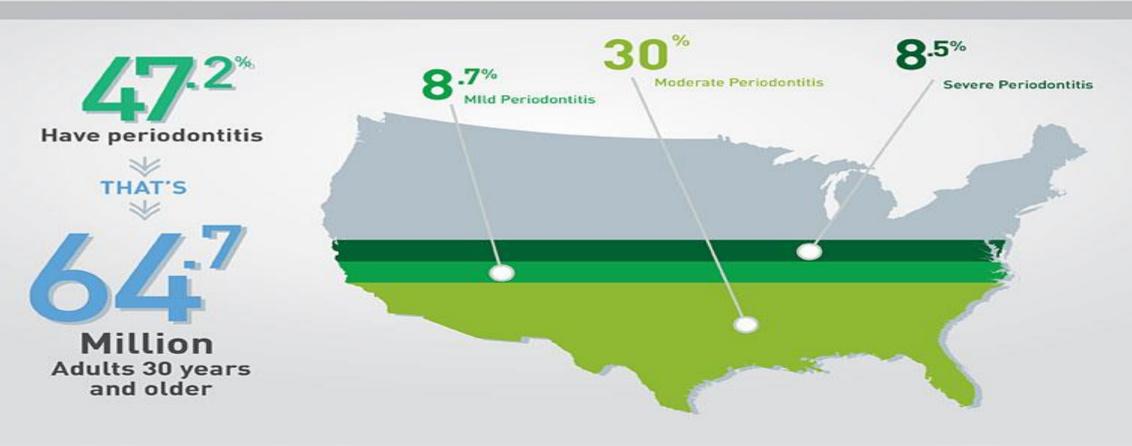
FDLE — Florida Department of Law Enforcement.

DATA INTERGATION :HIGH- RISK COHORT DISCOVERY

- Integrate diverse data (physical, social, clinical factors, environmental)

- Identify communities by burden of disease and environmental, social factors

- Analysis : risk factors associated with disease, e.g. racial/ethnic disparities, social determinants of health

Social determinants of oral health and disease in U.S. men

Scott L. Tomar, DMD, DrPH ✉

University of Florida College of Dentistry, Department of Community Dentistry & Behavioral Science, 1329 SW 16th Street, Room 5188, PO Box 103628, Gainesville, FL 32610-3628, USA
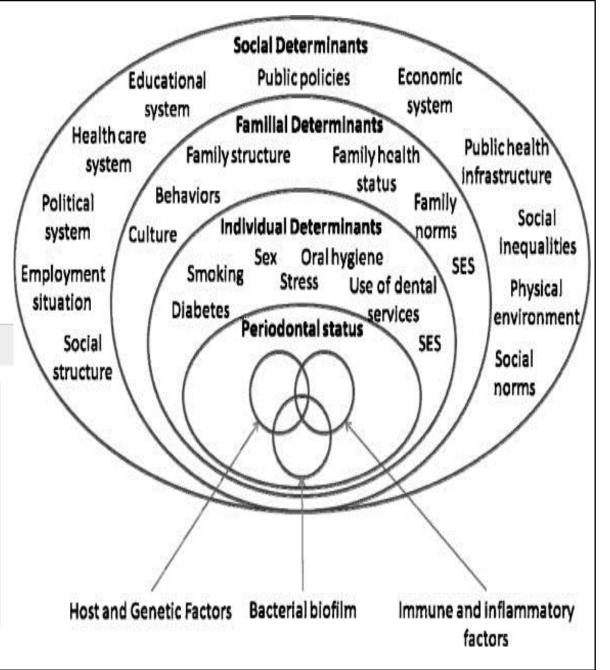
Abstract   Full Text   Images   References

Abstract

Oral diseases are among the most prevalent chronic diseases in the United States (U.S.), disproportionately affect males, and exhibit profound disparities among socioeconomic and ethnic groups. The potentially modifiable proximal risk factors for these diseases are relatively small in number though difficult to modify at the individual level, and largely are the same as those associated with increased risk for the major chronic diseases affecting Americans. This paper gives a brief overview of disparities in oral health in the U.S., presents a conceptual model

HEALTH ECONOMICS LETTER

THE RELATIONSHIP BETWEEN PERIODONTAL INTERVENTIONS AND HEALTHCARE COSTS AND UTILIZATION. EVIDENCE FROM AN INTEGRATED DENTAL, MEDICAL, AND PHARMACY COMMERCIAL CLAIMS DATABASE

KAMYAR NASSEH[a,*], MARKO VUJICIC[a] and MICHAEL GLICK[b]

[a]*American Dental Association, Health Policy Institute, Chicago, IL, USA*
[b]*University of Buffalo (The State University of New York), Buffalo, NY, USA*
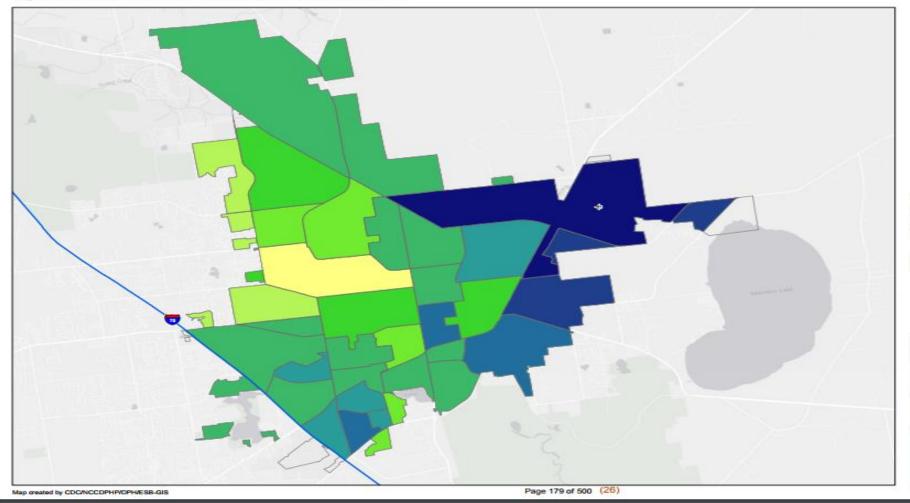
ABSTRACT
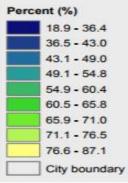
Periodontal disease has been linked to poor glycemic control among individuals with type 2 diabetes. Using integrated dental, medical, and pharmacy commercial claims from Truven MarketScan® Research Databases, we implement inverse probability weighting and doubly robust methods to estimate a relationship between a periodontal intervention and healthcare costs and utilization. Among individuals newly diagnosed with type 2 diabetes, we find that a periodontal intervention is associated with lower total healthcare costs (−$1799), lower total medical costs excluding pharmacy costs (−$1577), and lower total type 2 diabetes-related healthcare costs (−$408). © 2016 The Authors. *Health Economics* Published by John Wiley & Sons Ltd.

500 Cities: Local data for better health

The 500 Cities project is a collaboration between CDC, the Robert Wood Johnson Foundation, and the CDC Foundation. The purpose of the 500 Cities Project is to provide city- and census tract-level small area estimates for chronic disease risk factors, health outcomes, and clinical preventive service use for the largest 500 cities in the United States. These small area estimates will allow cities and local health departments to better understand the burden and geographic distribution of health-related variables in their jurisdictions, and assist them in planning public health interventions. See bottom of page for the note for data users. Learn more about the 500 Cities Project.

Visits to dentist or dental clinic among adults aged ≥18 years by census tract, Gainesville, FL, 2014

Percent (%)

- 18.9 - 36.4
- 36.5 - 43.0
- 43.1 - 49.0
- 49.1 - 54.8
- 54.9 - 60.4
- 60.5 - 65.8
- 65.9 - 71.0
- 71.1 - 76.5
- 76.6 - 87.1
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Current smoking among adults aged ≥18 years by census tract, Gainesville, FL, 2014

Percent (%)

- 2.0 - 11.3
- 11.4 - 14.4
- 14.5 - 17.3
- 17.4 - 20.2
- 20.3 - 23.2
- 23.3 - 26.5
- 26.6 - 30.2
- 30.3 - 34.6
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,
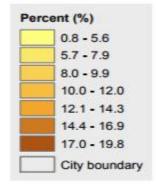
Diagnosed diabetes among adults aged ≥18 years by census tract, Gainesville, FL, 2014

Percent (%)
- 0.8 - 5.6
- 5.7 - 7.9
- 8.0 - 9.9
- 10.0 - 12.0
- 12.1 - 14.3
- 14.4 - 16.9
- 17.0 - 19.8
- City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.
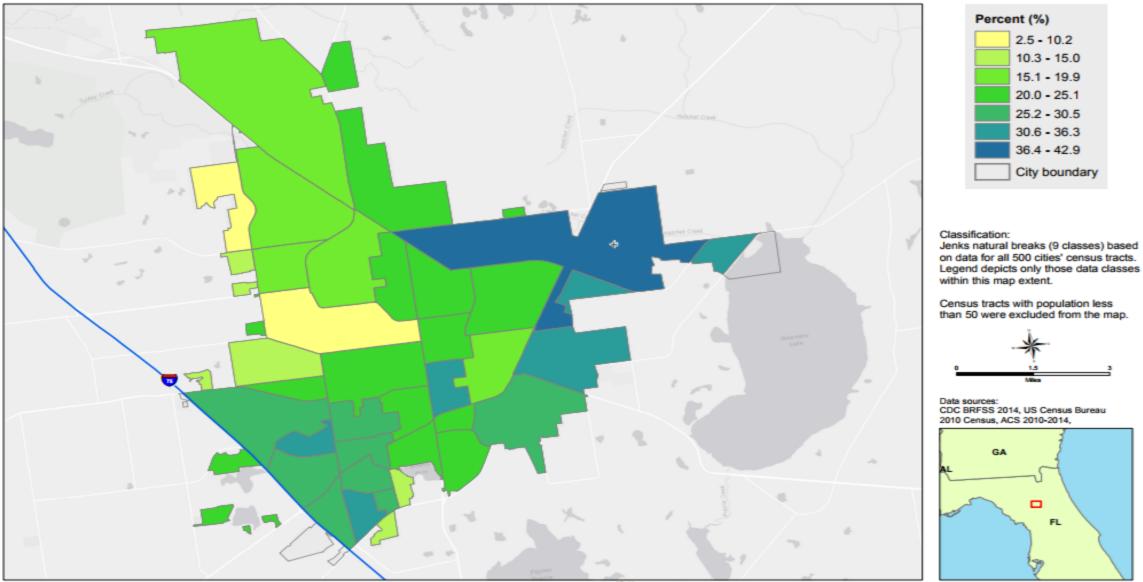
Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Current lack of health insurance among adults aged 18-64 years by census tract, Gainesville, FL, 2014

Percent (%)

	2.5 - 10.2
	10.3 - 15.0
	15.1 - 19.9
	20.0 - 25.1
	25.2 - 30.5
	30.6 - 36.3
	36.4 - 42.9
	City boundary

Classification:
Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

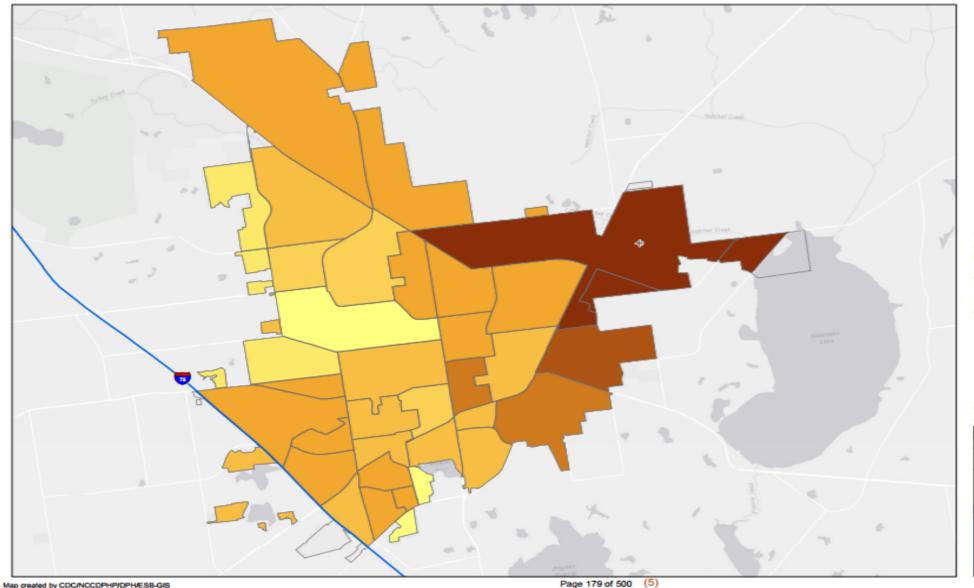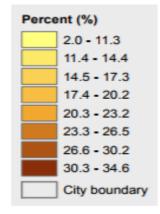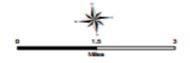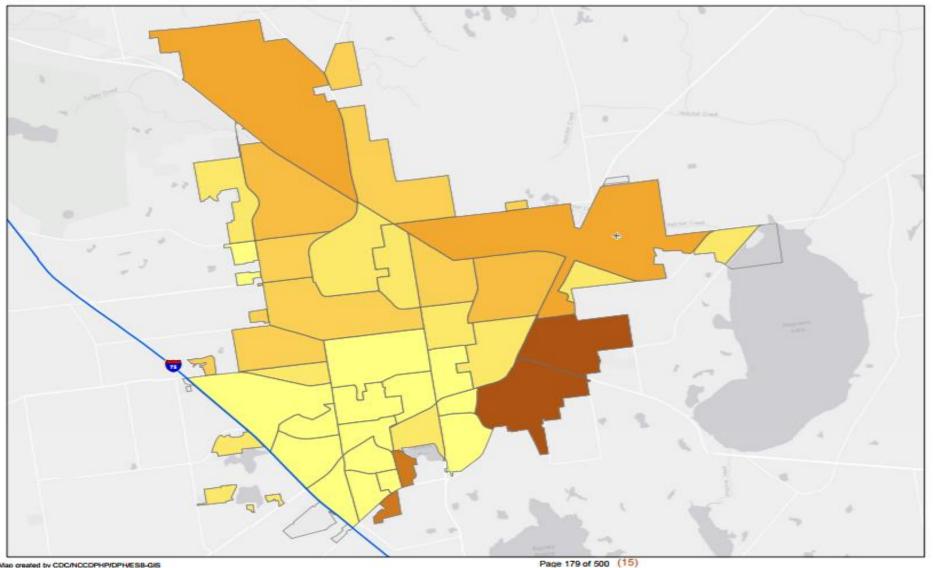Census tracts with population less than 50 were excluded from the map.

Data sources:
CDC BRFSS 2014, US Census Bureau 2010 Census, ACS 2010-2014,

Find Data by Topic

▶ Dental Caries (Tooth Decay)
- ▶ Dental Caries (Tooth Decay) in Children (Age 2 to 11)
- ▶ Dental Caries (Tooth Decay) in Adolescents (Age 12 to 19)
- ▶ Dental Caries (Tooth Decay) in Adults (Age 20 to 64)
- ▶ Dental Caries (Tooth Decay) in Seniors (Age 65 and Over)

▶ Periodontal (Gum) Disease
- ▶ Periodontal Disease in Adults (Age 20 to 64)
- ▶ Periodontal Disease in Seniors (Age 65 and Over)

▶ Tooth Loss
- ▶ Tooth Loss in Adults (Age 20 to 64)
- ▶ Tooth Loss in Seniors (Age 65 and Over)

▶ Oral Cancer
- ▶ Oral Cancer Incidence (New Cases) by Age, Race, and Gender
- ▶ Oral Cancer Prevalence (Total Number of Cases) by Age
- ▶ Oral Cancer 5-Year Survival Rates by Race, Gender, and Stage of Diagnosis

▶ Facial Pain
- ▶ Treatment Needs and Financial Costs Associated with TMJD
- ▶ Prevalence of TMJD and Its Signs and Symptoms

▶ Craniofacial Birth Defects
- ▶ Prevalence (Number of Cases) of Cleft Lip and Cleft Palate

Periodontal (Gum) Disease

Periodontal disease is the most common cause of tooth loss among adults.

Overall, the prevalence of both moderate and severe periodontal disease in adults and Seniors has decreased from the early 1970s. In spite of this improvement, significant disparities remain in some population groups.

The National Health and Nutrition Examination Survey (NHANES) has been an important source of information on oral health and dental care in the United States since the early 1970s. Click on the links below for details about the periodontal disease from the most recent survey (1999-2004).

▶ Adults Age 20 to 64

▶ Seniors Over 65
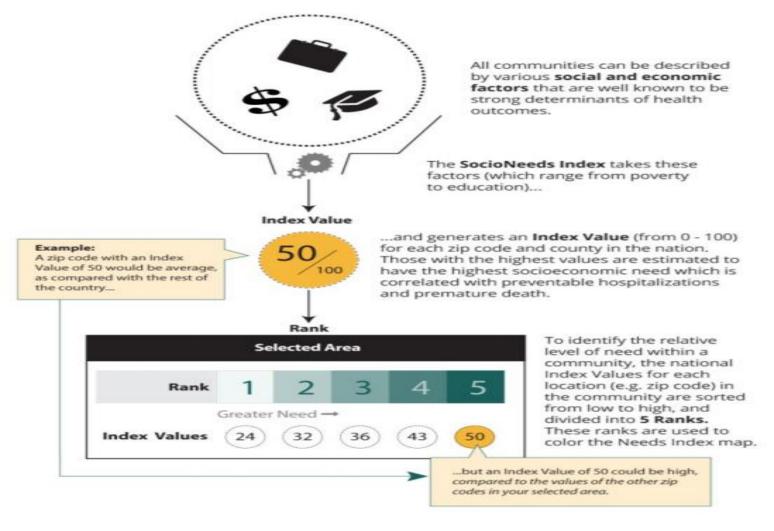
Community Health Needs Assessment

and Implementation Plan

June 30, 2016

UF Health Shands Hospital

How it Works

All communities can be described by various **social and economic factors** that are well known to be strong determinants of health outcomes.

The **SocioNeeds Index** takes these factors (which range from poverty to education)...

Index Value

50/100

Example:
A zip code with an Index Value of 50 would be average, as compared with the rest of the country...

...and generates an **Index Value** (from 0 - 100) for each zip code and county in the nation. Those with the highest values are estimated to have the highest socioeconomic need which is correlated with preventable hospitalizations and premature death.

Rank

Selected Area					
Rank	1	2	3	4	5
	Greater Need →				
Index Values	24	32	36	43	50

To identify the relative level of need within a community, the national Index Values for each location (e.g. zip code) in the community are sorted from low to high, and divided into **5 Ranks**. These ranks are used to color the Needs Index map.

...but an Index Value of 50 could be high, compared to the values of the other zip codes in your selected area.

SocioNeeds Index Table for the Zip Codes in the 7-County CHNA Region
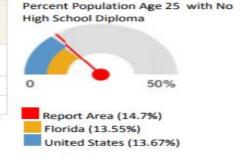
Zip Code	Index	Rank	Population estimate	County(ies)
32641	95	5	13,862	Alachua
32603	86.5	5	7,457	Alachua
32601	85.4	4	20,582	Alachua
32609	83.4	4	18,874	Alachua
32631	82.6	4	421	Alachua
32694	71.6	3	2,294	Alachua
32607	68.3	3	32,172	Alachua
32643	59.3	3	11,179	Alachua
32608	48.3	2	47,924	Alachua
32618	41.4	2	7,451	Alachua
32615	37	1	16,586	Alachua
32669	35.4	1	13,453	Alachua
32653	27.2	1	13,647	Alachua
32606	21.6	1	24,480	Alachua
32605	15.2	1	23,188	Alachua
32667	54.3	2	4,264	Alachua, Marion
32640	81.1	4	10,191	Alachua, Putnam
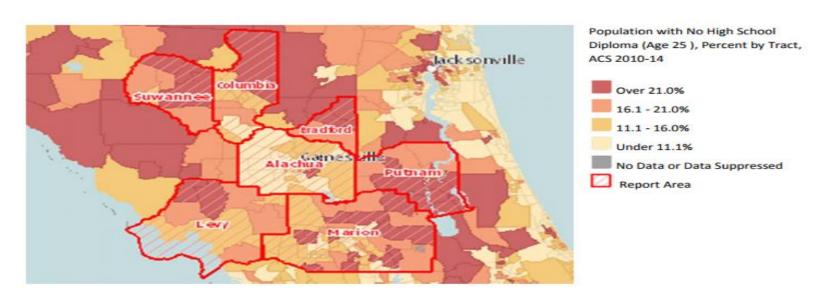
Population with No High School Diploma

Within the seven-county report area there are 84,032 persons aged 25 and older without a high school diploma (or equivalency) or higher. This represents 14.7% of the total population aged 25 and older. This indicator is relevant because educational attainment is linked to positive health outcomes (Freudenberg and Ruglis, 2007, http://www.cdc.gov/pcd/issues/2007/oct/07_0063.htm)

| Geography	Population Age 25	Population Age 25 with No High School Diploma	Percent Population Age 25 with No High School Diploma
7-County CHNA Area	571,753	84,032	14.7%
Florida	13,561,596	1,837,056	13.6%
United States	209,056,128	28,587,748	13.7%

Source: US Census Bureau, American Community Survey. 2010-14. Source geography: Tract

Percent Population Age 25 with No High School Diploma

Report Area (14.7%)
Florida (13.55%)
United States (13.67%)

Population with No High School Diploma (Age 25), Percent by Tract, ACS 2010-14

Over 21.0%
16.1 - 21.0%
11.1 - 16.0%
Under 11.1%
No Data or Data Suppressed
Report Area

INTERDISCPLINARY

INTERVENTION COMPONENTS

2. Enhance Community Knowledge and Attitude with Information and Education (Health Literacy)

- Risk communication and message development
- Sensitivity to language, culture
- Identify and consider media channels

  - Mass
  - Local
  - Individual

- Analysis results may be utilized in targeted health education campaigns

INTERVENTION

Oral Health Literacy and Measures of Periodontal Disease

Jennifer S. Holtzman[*], **Kathryn A. Atchison**[†], **Mark D. Macek**[‡], and **Daniela Markovic**[§]

[†]Division of Public Health and Community Dentistry, School of Dentistry, University of California, Los Angeles
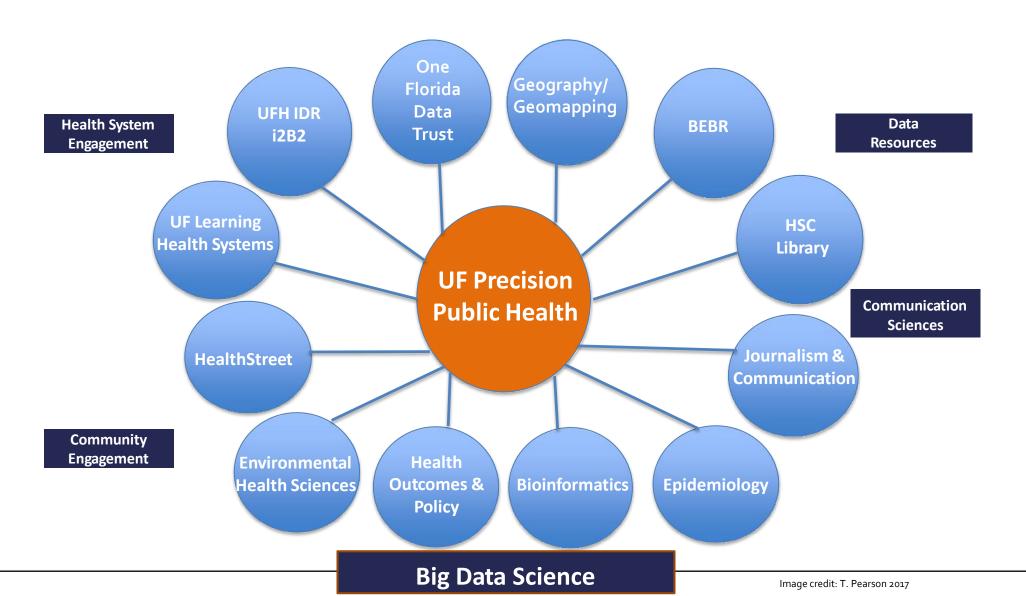
[‡]Department of Health Promotion and Policy, Division of Health Services Research, University of Maryland Dental School, Baltimore, MD

[§]Department of Biomathematics, University of California, Los Angeles

WORKGROUP OBJECTIVE

- Integrate university-wide programs to develop an infrastructure for precision public health

INTEGRATION OF PROGRAMS

Image credit: T. Pearson 2017

INTERVENTION COMPONENTS

3. ## Community Organization & Engagement

- Engage communities with appropriate risk messages via effective media channels
- Formative research
  - Focus Groups
  - Surveys
  - Identification and involvement of stakeholders and leaders
- Collective planning and action

HealthStreet

RESEARCH HELPING PEOPLE

UF HealthStreet
UNIVERSITY of FLORIDA

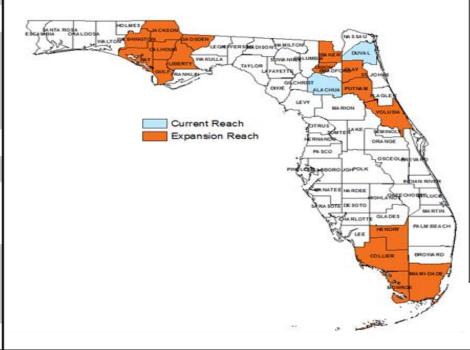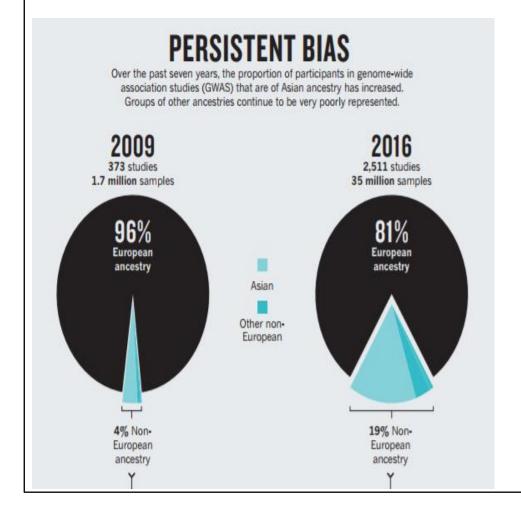| Demographics	Total Members (N=9,215)
Female	59.1%
Average Age	44.0 years
Ethnicity:	
Asian	1.2%
African-American	60.3%
Caucasian	33.0%
Other	5.5%
Latino/Hispanic	6.1%
12+ years education	79.1%
Saw healthcare provider in past 12 months	81.4%
Insurance Status:	
Private	27.6%
Medicaid/Medicare	32.9%
No Insurance	39.5%
Employed	34.8%

AIMS

1. Assess medical problems and health concerns from community residents themselves
2. Link people, based on their needs and concerns, to medical and social services and opportunities to participate in health research
3. Engage in bidirectional, health-promoting communication with and for the community
4. Increase the community's trust in the research enterprise through meaningful collaboration

Reach of HealthStreet

Current Reach
Expansion Reach

9,215	Total HealthStreet Members
26	# of counties we are in
96%	Members interested in research
51%	Members navigated to research
43%	Members enrolled in research
16	Colleges/Insts assisted
169	Investigators receivied assistance
23,000+	Services provided (eg blood pressure, HIV screening, clothing, etc.
17,000+	Referrals given for medical and social services

FOR A FEW OR MANY?

PERSISTENT BIAS

Over the past seven years, the proportion of participants in genome-wide association studies (GWAS) that are of Asian ancestry has increased. Groups of other ancestries continue to be very poorly represented.

2009
373 studies
1.7 million samples

96% European ancestry

4% Non-European ancestry

2016
2,511 studies
35 million samples

81% European ancestry

19% Non-European ancestry

Asian

Other non-European

Genomics for the world

Medical genomics has focused almost entirely on those of European descent. Other ethnic groups must be studied to ensure that more people benefit, say

Carlos D. Bustamante, Esteban González Burchard, and Francisco M. De La Vega

Genomics is failing on diversity

An analysis by **Alice B. Popejoy** and **Stephanie M. Fullerton** indicates that some populations are still being left behind on the road to precision medicine.

INTERVENTION COMPONENTS

4. Assurance of Personal Health Services
5. Environment, housing, food, and water.
     Nutrition
     Physical Activity
     Smoke-free Air
6. Leadership, policy development, and administration.
     Financial
     Legal
     Regulatory
     Trade

WORKGROUP OBJECTIVE

- Create methods to overcome challenges of conducting precision public health research

CROSS- DISCIPLINE CHALLENGES

In your field, what are the challenges of Precision Public Health?

CHALLENGES

- Minimizing selection bias- Bioinformatics

- Impact on effect size estimates using machine learning instead of traditional linear models – Epidemiology

- Lengthy data application process (data request review committee, IRB etc.) – Biostatistics

- Lack of social determinants of health in patient data- Geography

- Availability and accessibility to relevant, high-quality large datasets-All

WORKGROUP OBJECTIVE

- Develop an educational initiative to increase precision public health research

    Grants & Internships

Purpose and Areas of Interest

The UF Informatics Institute and UF Clinical and Translational Science Institute are jointly funding a one-time pilot opportunity focused on advanced data integration and analytics for translational health research, which emerged as a recurring opportunity and challenge during the CTSI-UFII Fall 2017 Roundtable Series for Advanced Data Capabilities and Methods Development in the Translational Health Sciences. **This RFA will support multidisciplinary pilot projects involving collaborators from two or more colleges that advance the development of novel methods, techniques or technologies with the potential to accelerate high-impact opportunities for data integration and analytics in two areas:**

- **Precision medicine:** integration of datasets and development of analytic approaches with the potential to yield new clinical or biological insights that could inform the development of more precise diagnosis, treatment or prevention approaches at the individual level.

- **Precision public health:** integration of datasets and development of analytic approaches with the potential to enable more precise identification of communities at risk for health disparities and yield new insights that could inform the development or delivery of evidence-based interventions tailored to a community's needs.

Applicants are strongly encouraged to develop their projects in accordance with FAIR Data Principles, which include Findability, Accessibility, Interoperability and Reusability.[1]

Total Available Funding and Award Amounts

UFII and CTSI will make a total of up to $150,000 available for this RFA depending on quality of submissions and budget availability. Teams can apply for awards of up to $75,000 each.

2017 INTERNSHIP

Aim : Cohort Discovery with Dataset Collection

• Develop a case study through examination of data sources on Library Guide to identify a subpopulation at-risk in Alachua County, Florida.

• Document research methods and challenges.

Precision Public Health: An Infrastructure Initiative at the University of Florida

Brittney J. Roth, BS; Thomas A. Pearson, MD, MPH, PhD; Deepthi S. Varma, PhD, MSW; Robert H. Kolb, RN, BS, CCRC

UF Clinical and Translational Science Institute, UNIVERSITY of FLORIDA

UF Department of Epidemiology, UNIVERSITY of FLORIDA

Introduction

Precision Public Health uses an intersection of multiple disciplines to create targeted health campaigns and interventions, which in turn helps to improve the overall health of a subpopulation within a larger community. This poster demonstrates an infrastructure initiative that aimed to build a database which can be used for precision public health. A compilation of credible data sources would allow researchers to examine multiple data sources to identify underserved populations or disease cohorts within certain population. This cohort discovery would help create tailored interventions.

Aims

Aim 1: Identify Data Sources
Identify available data sources for the infrastructure.

Aim 2: Cohort Discovery as a Demonstration of the Infrastructure
Examine available data sources to identify health needs or health service gaps in Alachua county, Florida.

Methods

Aim 1:
- A list of federal, state or local-level data sources that could be applied to public health research was compiled.
- Additional information such as population and location specificity, availability, and cost of each data source were also collected.
- Local resources were defined as agencies who collected data in the state of Florida, had county-level data and had an established relationship with the University of Florida.
- The Health Science Center librarians created a Library Guide for the identified data sources and the list is publicly available to the University of Florida.
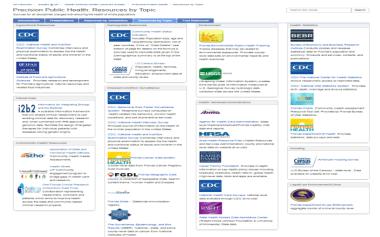
Aim 2: Cohort Discovery
- *Data sources identified:* CDC's Community Health Status Indicators, Health Street's Community Health Needs Assessment, and i2b2. Selected based on relevancy to chronic diseases, and county-level indicators.
- *County:* Alachua
- *Chronic Diseases:* Hypertension, Diabetes, Obesity
- Sample size and distribution was determined for each data source.
- Number of cases, prevalence and relative risk of each chronic disease was calculated from i2b2 data.
- Demographic information, marital status, and smoking status was examined across each condition to find an at-risk population.

| Data Source	N	Comments
CDC's CHSI	251,417	High-level county overview of health status indicators for all of Alachua county. County-level demographic information
HealthStreet's CHNA	Medicaid/Medicare = 1,968 Uninsured = 2,120	Self-reported, county-level information regarding Medicaid/Medicare and uninsured population
i2b2	51,163	De-identified, electronic health record data from UFHealth focused on county-level Medicaid and uninsured population
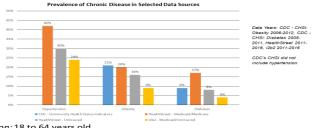
Results

Precision Public Health Library Guide
The library guide developed as part of this project can be found at http://guides.uflib.ufl.edu/ -> selecting the Public Health and Health Professions Section -> Precision Public Health. The direct link is: http://guides.uflib.ufl.edu/precisionpublichealth

Cohort Discovery Demonstration

Prevalence of Chronic Disease in Selected Data Sources

Data Years: CDC - CHSI: Obesity 2006-2012, CDC - CHSI: Diabetes 2005-2011, HealthStreet 2011-2016, i2b2 2011-2016

CDC's CHSI did not include hypertension

- *Age range of population:* 18 to 64 years old
- *Gender:* Female (exception HealthStreet's uninsured population)
- *Race:* African-American or White
- *Insurance status:* CDC's CHSI - 20% of Alachua county is uninsured, HealthStreet members - 35% are on Medicaid or Medicare and 38% are uninsured, I2b2 - 77% reported Medicaid and 23% self-pay (among queried population).
- *Marital Status:* Over half of HealthStreet's uninsured population was single, 45% of HealthStreet's Medicaid/Medicare and 41% of i2b2's population reported single.
- *Employment:* 22% and 32% of HealthStreet's Medicaid/Medicare and uninsured population were employed. CDC's CHSI reported 5.4% of Alachua county was unemployed as of 2013.

Table 1: Cases, Prevalence and Relative Risk from i2b2 Data

	Hypertension			Obesity			Diabetes		
	n	%	RR	n	%	RR	n	%	RR
Sex									
Male	5027	21.0%	0.77	1478	6.2%	0.50	811	3.4%	0.78
Female	7369	27.1%	Control	3342	12.3%	Control	1172	4.3%	Control
Race									
American Indian or Alaska Native	25	30.9%	1.20	12	14.8%	1.97	4	4.9%	1.39
Asian	137	17.1%	0.66	28	3.5%	0.46	23	2.9%	0.81
African-American	5882	25.9%	1.01	2789	12.3%	1.63	1071	4.7%	1.33
Native Hawaiian or Other Pacific Islander	11	13.1%	0.51	0	0.0%	0.08	0	0.0%	0.17
White	5291	25.7%	Control	1550	7.5%	Control	732	3.6%	Control
Multiracial	101	17.0%	0.66	48	8.1%	1.08	7	1.2%	0.33
Other	865	14.9%	0.58	350	6.0%	0.80	122	2.1%	0.59
Age									
0-17	1888	8.6%	0.35	1615	7.4%	0.76	66	0.3%	0.16
18-34	3917	24.8%	Control	1521	9.6%	Control	298	1.9%	Control
35-44	2034	35.9%	1.45	724	12.8%	1.33	354	6.2%	3.31
45-54	1911	51.4%	2.07	482	13.0%	1.35	489	13.2%	6.98
55-64	2056	66.5%	2.68	410	13.3%	1.38	604	19.5%	10.35
>=65	584	61.9%	2.50	66	7.0%	0.73	170	18.0%	9.55
Marital Status									
Married/Life Partner/ Significant Other	2152	43.8%	1.36	598	12.2%	1.15	479	9.8%	1.89
Divorced/Separated/ Widowed	1384	59.9%	1.86	335	14.5%	1.37	315	13.6%	2.63
Single	6757	32.2%	Control	2224	10.6%	Control	1084	5.2%	Control
Smoking Status									
Current Smoker	3598	38.6%	1.04	762	8.2%	0.57	601	6.5%	0.96
Never Smoked	4377	37.1%	Control	1686	14.3%	Control	790	6.7%	Control
Former Smoker	2135	56.0%	1.51	708	18.6%	1.30	467	12.3%	1.83

n=Cases, %=Prevalence, RR=Relative Risk

Implications and Discussions

This project demonstrated that an underserved population within Alachua county could be discovered using the infrastructure. While the Medicaid and uninsured population are usually an underserved group, the additional factors of being African-American and female or divorced/separated/widowed further emphasizes the needs for a population-specific intervention to help manage and reduce chronic disease.

The Precision Public Health Initiative could make a significant impact on the way research is conducted at the University of Florida. It would allow investigators to perform cohort discovery and secondary data analysis through one centralized data repository. Once linked, the resource could examine multiple data sources for a health risk, or disease. The infrastructure would also support the identification of underserved groups to create research focus areas. This would allow for the infrastructure to act as a bridge between investigators and underserved communities, allowing for focused treatment interventions within populations that need attention most.

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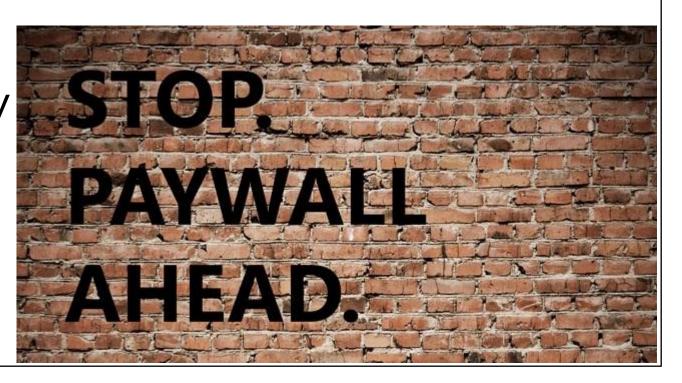
INTERNSHIP 2018

- Perform comprehensive evaluation of dataset collection
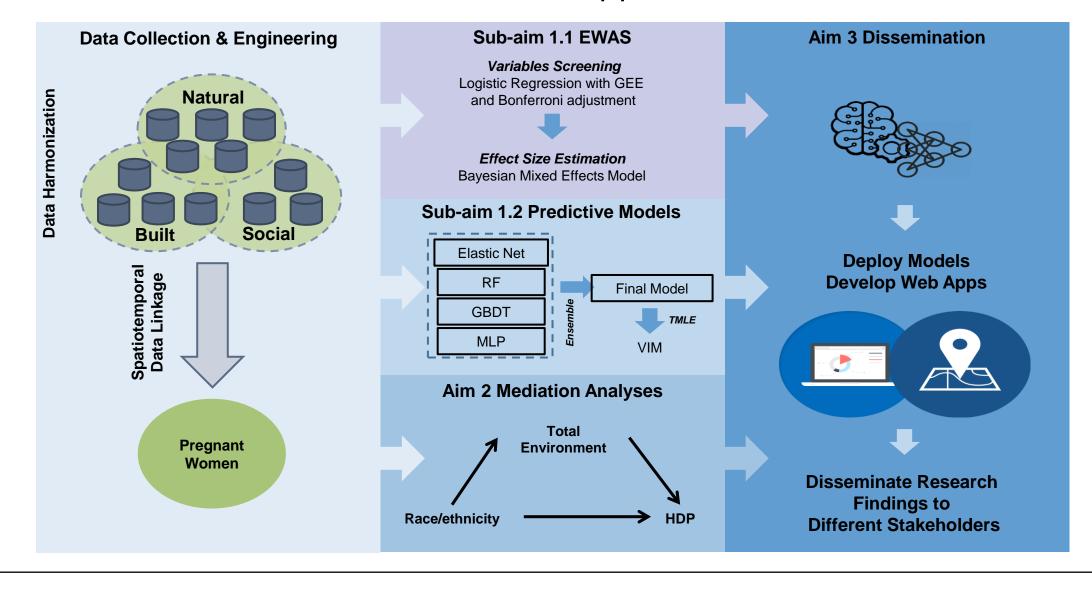   apply metadata or data dictionaries

- Create an integrated workflow using R computational platform packages

- Document research methods and challenges

CHALLENGES FOR INTERNS

- Data sharing, Privacy, Trust, Accessibility

- Pay Walls

- Missing values, variables

- Lack of data transparency

The Total Environment and Hypertensive Disorders of Pregnancy: A Precision Public Health Approach

FUTURE LANDSCAPE

Breaking Down Data Silos – Data Sharing and EHR Interoperability

Session Synopsis: Traditional data silos too often slow down the scientific progress. To benefit from a data-driven healthcare approach we need to make data accessible, manageable, and interpretable. This requires data standardization and overcoming interoperability issues, a major focus of this session.

EHR/EDR INTEGRATION & INTEROPERABILITY

- Medicine
  - approximately 1100 vendors that offer an EHR - twice the number of vendors 4 years ago

- Dentistry
  - 4 major vendors offer an EDR

The Transformation from Dentist to Healthcare Provider

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Submission: July 24, 2017; **Published:** November 28, 2017

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Abstract

The changes in the healthcare system and the focus of recent research have created an opportunity for dentistry to finally integrate the profession into the overall healthcare of the patient. Technology, social media and big data will allow this change if seized by the profession to be rapid. This opinion piece provides the rationale and academic pathway for this approach to becoming oral healthcare providers in the evolving healthcare system

Keywords: Oral health care; Periodontal disease; Inflammation; Caries; Cancer; Education
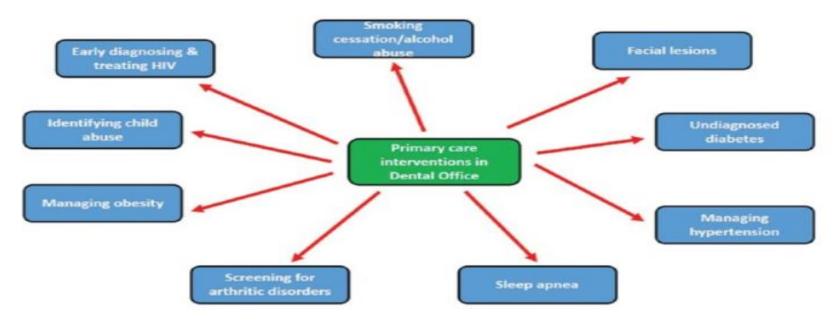
Figure 1

Various primary care procedures that can be conducted in dental office

SIDEBAR: COULD DENTISTRY SOLVE PRECISION MEDICINE'S PRIVACY HURDLE?

One of the main obstacles to a precise, data-driven approach to researching, managing and preventing disease is concern about data privacy. "Most of our challenges are not technical, but social," notes Russ Altman, MD, PhD, a professor of bioengineering, genetics and medicine at Stanford University, and a founding member of the International Society for Computational Biology. "People are worried about the privacy of their data and who has access to it — and with good reason."

The future of precision medicine that Altman envisions must rely on patients voluntarily sharing their personal information. It will not work if patients have no choice about whether their data is submitted to a central database and shared with other health care providers and researchers. "Everybody I know who thinks about this believes that the patient needs to be in control of the data," he says.

To convince patients that it's OK to share health data such as their own DNA sequence, it may help to study the example of dental records, explains George D. Demetri, MD, director of the Boston-based Center for Sarcoma and Bone Oncology at the Dana-Farber Cancer Institute and a professor of medicine at Harvard Medical School. "We've seen a big public debate about genetic privacy, but we've all been identifiable by dental records for decades," he says. "When there is a plane crash, the first thing authorities do is find the dental records to identify the victims. Why are people not scared about sharing dental records, or picking up on the fact that dental records are a

CITIZEN ENGAGEMENT

The Pathway to Patient Data Ownership and Better Health

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Digital health data are rapidly expanding to include patient-reported outcomes, patient-generated health data, and social determinants of health. Measurements collected in clinical settings are being supplemented by data collected in daily life, such as data derived from wearable sensors and smartphone apps, and access to other data, such as genomic data, is rapidly increasing. One projection suggests that a billion individuals will have their whole genome sequenced in the next several years.[1] These additional sources of data, whether patient-generated, genomic, or other, are critical for a comprehensive picture of an individual's health.

Enabling access to personal health data, clinical or patient-generated, may benefit patients and health care professionals. Research is beginning to show that providing patients with their complete health data may help improve their health. For example, timely access to laboratory results can increase patient engagement.[2] Access to physician notes after appointments appears to encourage individuals to improve their health and participate in decision-making, with electronically engaged patients demonstrating more successful medication adherence, quality outcomes, and symptom management.[3] Economic benefits may include the avoidance of duplicative imaging or laboratory tests.[4] Clinicians may also benefit from more informed patients. For example, they may score higher in quality performance programs because patients who are more informed may better adhere to treatment plans and hence may improve clinician

health data. For this to proceed, control of health data must be transferred to the patient or the patient's authorized representative.

More specifically, to obtain active patient engagement and health system improvement, 3 components are necessary: (1) common data elements that enable the sharing and merging of health data from multiple sources; (2) a patient encounter data receipt, comprised of relevant health data from each health care encounter, automatically pushed to the patient's complete digital health record; and (3) a contract between patients and third-party health data managers (eg, health care organizations and commercial entities) that enables individuals to control their longitudinal digital health record. Most of these components already exist in some form, requiring only minor adjustments to effect health system transformation.

Clinicians, patients, and health care systems need a way to efficiently receive, integrate, understand, compute, and use digital health data from other practitioners and health encounter locations. This requires the merging of what is often disparate data from multiple sources, and the most effective way to do this is to establish common data elements agnostic of any particular vendor's electronic health record (EHR) system.

With widespread implementation of common data elements and value sets, semantic and clinical interoperability can be achieved, and health information can be merged, while maintaining data integrity. New initiatives, such as the Standard Health Record,[7] that focus on standardizing data within health rec-

Precision Health

Precision prevention, treatment, and public health interventions will be available to all people based on their unique variations in genetic, biological, behavioral, and social determinants of health. Individual and population-based dental, oral, and craniofacial prevention and treatment strategies will be scientifically-based and validated.

Oral Health + Overall Health

Oral health will be fully integrated into the study of overall health through a deeper and more complex understanding of the underlying biological, behavioral, and social factors that cause disease or support health in the dental, oral, and craniofacial region and throughout the body.

NEXT STEPS

- Advance: data sharing, evidence-based, targeted interventions

- Refine research methodologies

- Engage community education and partnerships

- Power of Convening

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