POPULATION HEALTH:
FROM CONCEPT TO PRACTICE

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President
American Nursing Informatics Association

American Nursing Informatics Association
ANIA
Where caring and technology meet

ANIA SOCAL CHAPTER

American Nursing Informatics Association

The purpose is to advance the field of nursing informatics through communication, education, research and professional activities.

American Nursing Informatics Association

ANIA

Where caring and technology meet

American Nursing Informatics Association

- History
  - CARING -1982
  - ANIA - 1992
  - Merge of ANIA and CARING 2010
- Three Regions
  - West
  - Central
  - East
- 13 National Chapters
- Nursing Informatics Today – Quarterly Publication
- 11 Member Board
  - Meets Quarterly

ANIA 2016

- April 21 – 23
- Certification Review Course
- Member $500 by 3/17
- Hyatt Regency Embarcadero
  - Room Rate $219

Conflict of Interest Statement

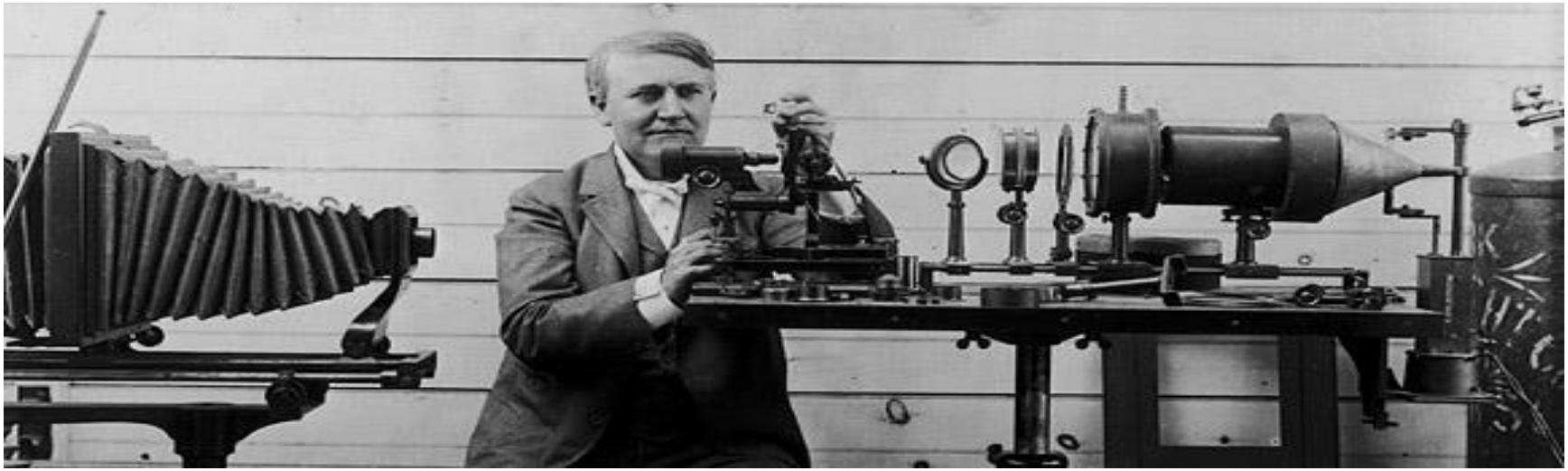
Charles Boicey is the Chief Innovation Officer for Clearsense

Objectives

- The participant will be able to state the differences between Public Health and Population Health.
- The participant will list the data sources required to adequately assess a population.
- The participant will describe the key components of a “Community Needs Assessment.

“The doctor of the future will give no medicine, but instead will interest his patients in the care of human frame, in diet, and in the cause and prevention of disease”.

Thomas Edison (1847 – 1931)



Be Original Already

- Keep an open mind
- Don’t work alone
- Ask lots of questions
- Explore
- Learn then rebel

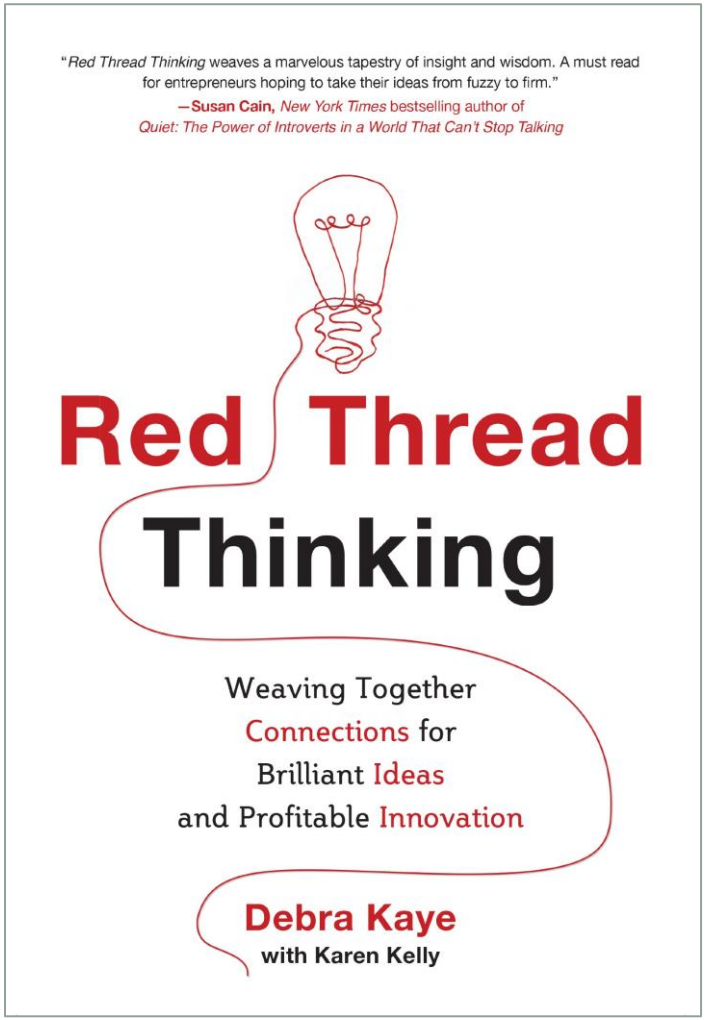
https://youtu.be/Uq-FOOQ1TpE

Thinking Differently

"Look for patterns and ask why those patterns exist."

"Embrace curiosity, be open, playful, and persistent."

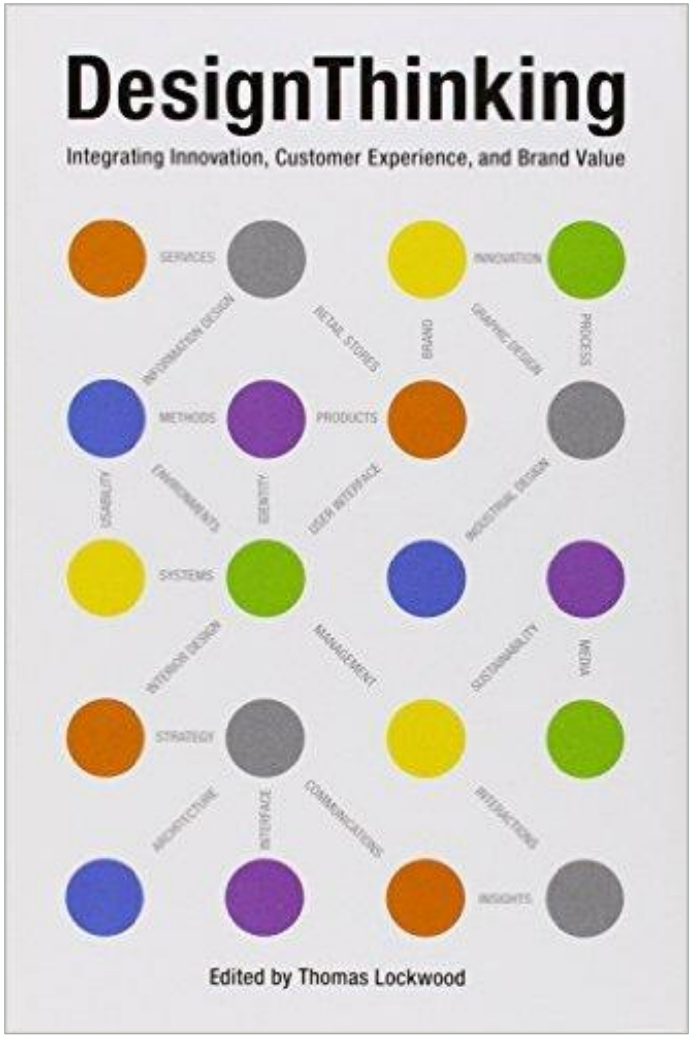
Debra Kaye



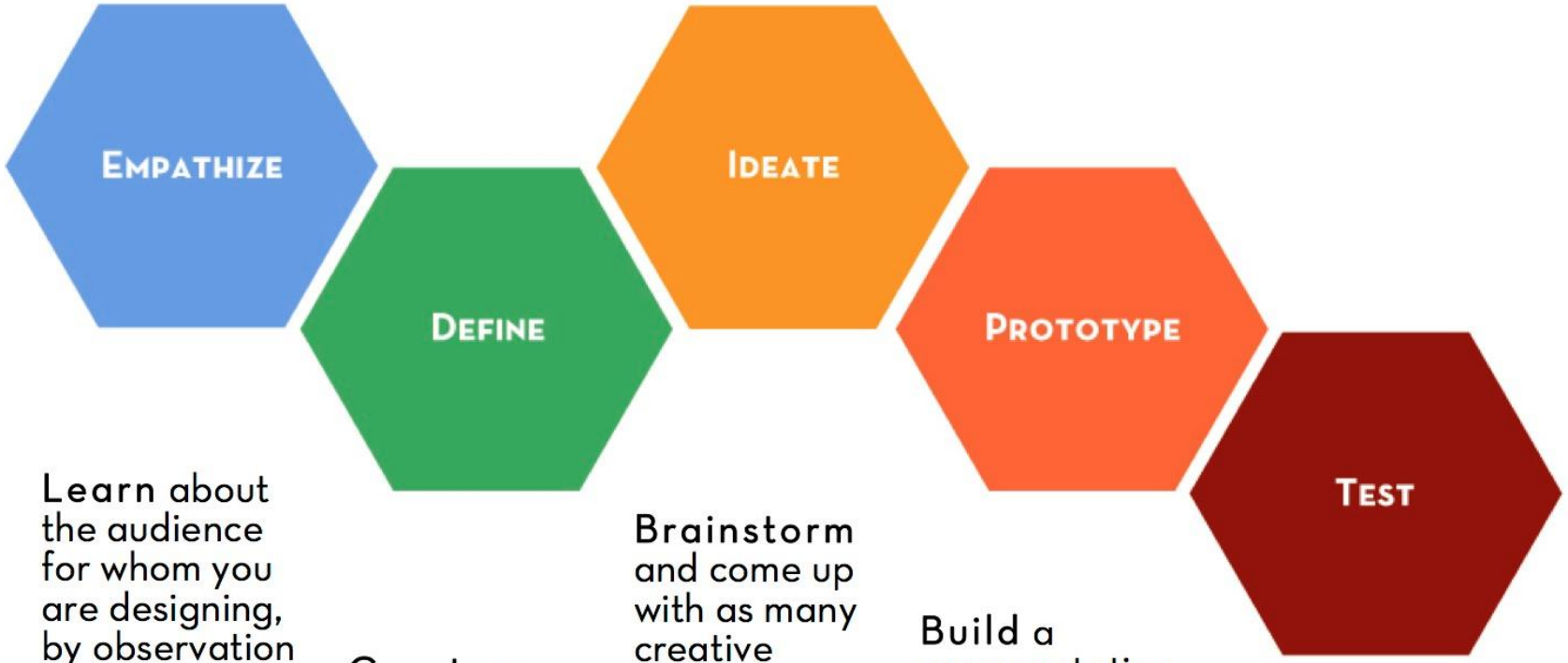
Design Thinking

“Design is the action of bringing something new and desired into existence—a proactive stance that resolves or dissolves problematic situations by design. It is a compound of routine, adaptive and design expertise brought to bear on complex dynamic situations.”

Harold Nelson



We are all DESIGNERS!



Learn about the audience for whom you are designing, by observation and inteview. *Who is my user? What matters to this person?*

Create a point of view that is based on user needs and insights. *What are their needs?*

Brainstorm and come up with as many creative solutions as possible. *Wild ideas encouraged!*

Build a representation of one or more of your ideas to show to others. *How can I show my idea? Remember: A prototype is just a rough draft!*

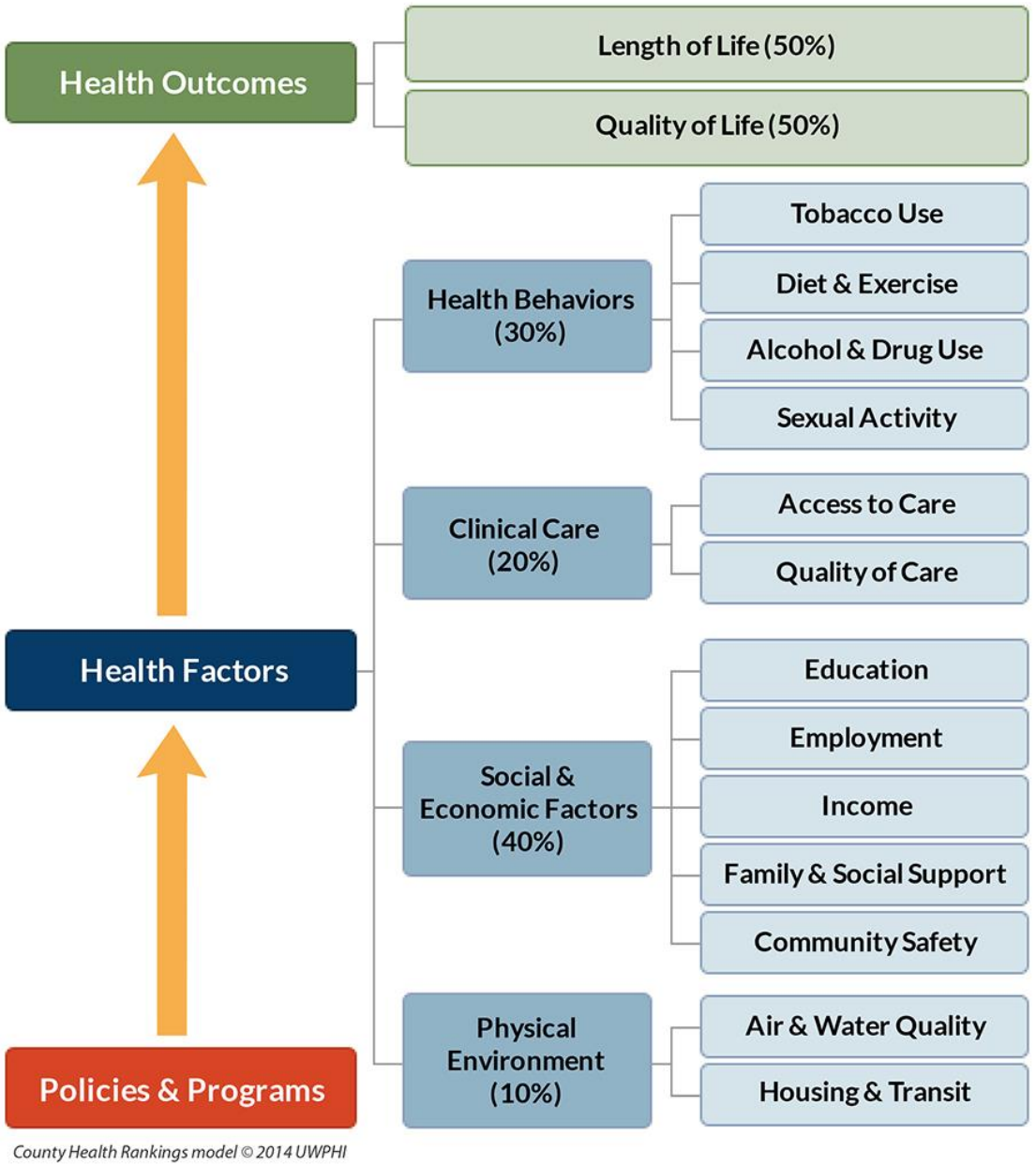
Share your prototyped idea with your original user for feedback. *What worked? What didn't?*

Public Health

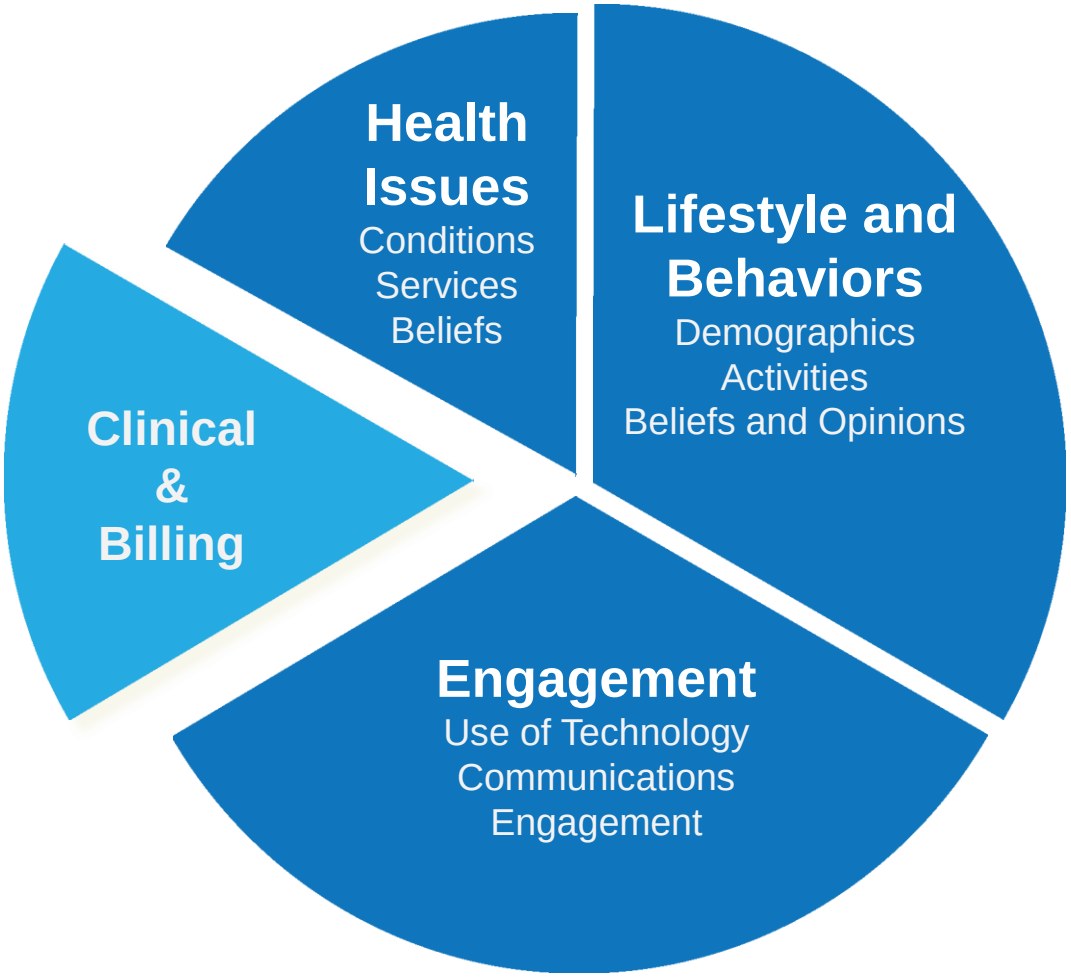
The broader current definition of the public health system offered by the Institute of Medicine reaches beyond this narrow governmental view. Its report, The Future of the Public's Health in the 21st Century, calls for significant movement in "building a new generation of intersectoral partnerships that draw on the perspectives and resources of diverse communities and actively engage them in health action."

Institute of Medicine. (2002). The Future of the Public's Health in the 21st Century. Washington, DC, The National Academies Press.

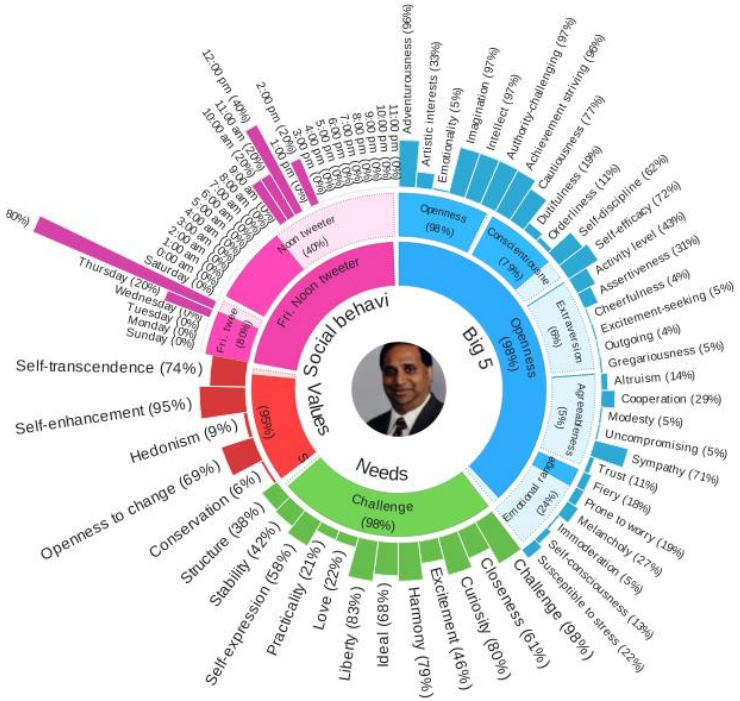
Population Health



Moving Beyond Clinical & Billing Data



Taking the Lead from Retail



IRi Growth delivered.

Experian Simmons

KANTAR MEDIA

nielsen

CoreLogic

acxiom

Health Issues

Chronic Diseases
Cancer
Conditions Have
Conditions Treated
Conditions Not Treated
Mental Health

Care Access and Utilization

Care Utilization
Medications
Health Insurance
Insurance Purchasing
Discussed with Provider

Demographics

Gender, Age, Education
Household Composition
Life Changes and Housing
Language and Ethnicity
Employment
Income and Assets
Financial
Transportation

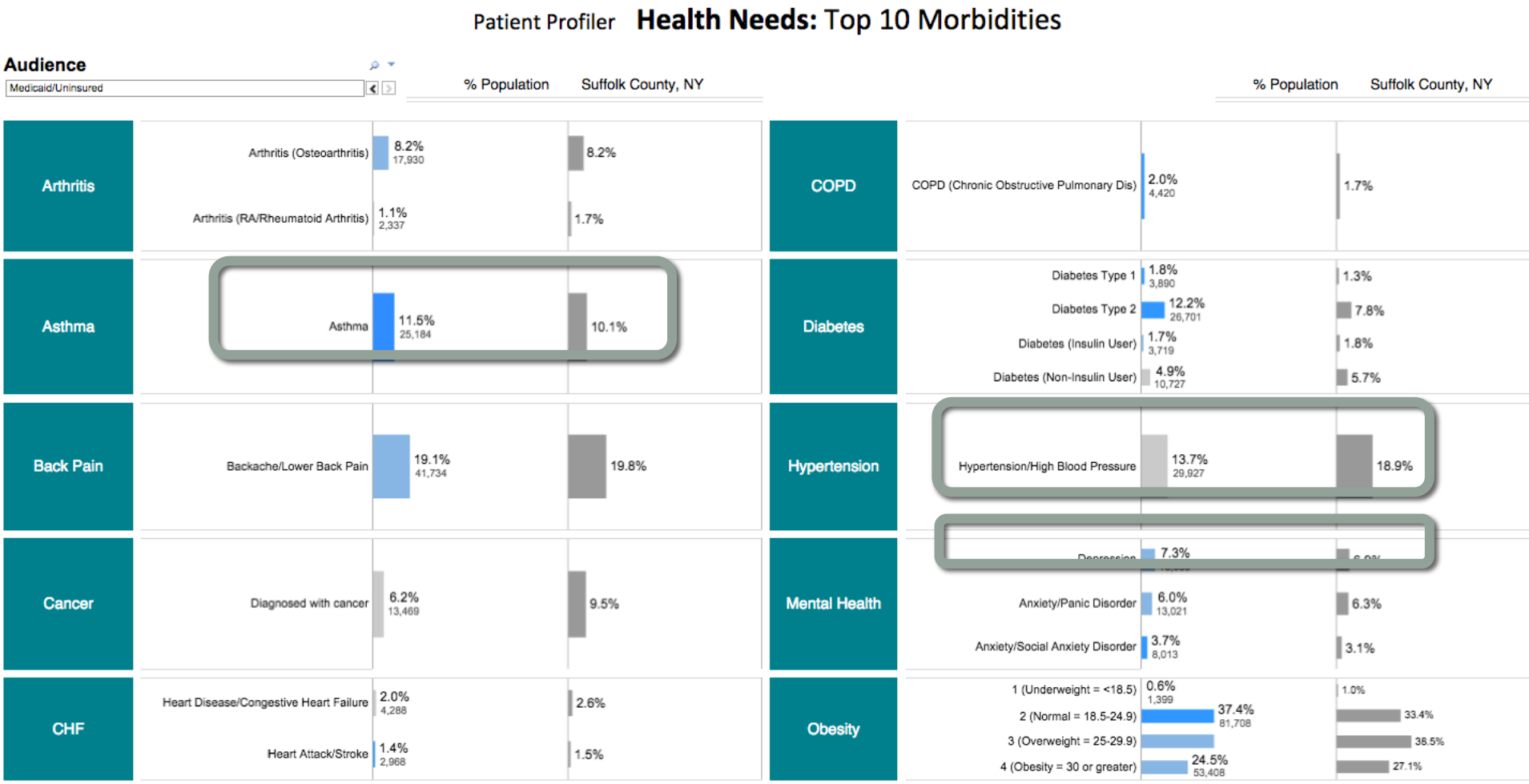
Communications

Social Isolation
Patient Education
Digital Engagement
Health Marketing
Activities and Destinations

Health Activities and Beliefs

Smoking
Alcohol
Diet and Weight Loss
Exercise
Health Attitudes
Perception of Wellness

What are the Health Disparities of the Medicaid/Uninsured Population?



What is the Care Utilization of the Medicaid/Uninsured Population?

Patient Profiler

Health Needs: Care Utilization

Audience

Medicaid/Uninsured

Practitioners Seen

	% Population	Suffolk County, NY
General/Family Practitioner	33.5%	44.2%
Dentist	24.2%	34.1%
Sole Type Professional Consulted ..	21.9%	21.0%
Eye Doctor	18.6%	25.1%
Ob/Gyn	15.8%	14.8%
Pharmacist	13.3%	16.5%
Dermatologist	10.9%	9.9%
Podiatrist	8.4%	6.2%
Nurse Practitioner	8.1%	7.8%
Physical Therapist	7.6%	5.6%
Gastroenterologist	7.4%	9.1%
Ear, Nose & Throat	6.8%	5.3%
Chiropractor	6.7%	8.0%
Pediatrician	6.0%	2.9%
Internist	4.7%	7.2%
Cardiologist	4.1%	8.0%
Allergist	1.6%	5.3%
Alternative Health Practitioner	1.5%	1.0%
Acupuncturist	0.8%	1.7%
Osteopath	0.2%	0.4%
Endocrinologist: Any	2.1%	2.1%

Hospitals Used Past 3 Years (Household)

	% Population	Suffolk County, NY
Any hospital used	72.8% 158,943	71.2%
North Shore University Hospital	7.2%	3.7%
Robert Wood Johnson University Hospi..	6.1%	5.0%
Long Island Jewish Medical Center	5.3%	3.7%
Bridgeport Hospital	4.2%	2.6%
Staten Island University Hospital	3.8%	1.5%
Winthrop University Hospital	3.7%	2.5%
Mount Sinai Medical Center	2.7%	2.3%
Hackensack University Medical Center	2.6%	4.5%
Valley Hospital	2.4%	3.2%
St. Joseph's Hospital	2.3%	1.7%
Saint Barnabas Medical Center	2.2%	2.6%
Raritan Bay Medical Center	2.1%	1.2%
Columbia University Medical Center	2.1%	1.8%
Good Samaritan Hospital Medical Center	2.1%	3.3%
JFK Medical Center	2.0%	2.6%
St. Peter's University Hospital	2.0%	1.8%
Holy Name Hospital	2.0%	1.7%
Beth Israel Medical Center (New York ..	2.0%	0.8%
Monmouth Medical Center	1.9%	2.0%
Overlook Hospital	1.7%	2.3%
Montefiore Medical Center	1.6%	1.5%
Yale/New Haven Hospital	1.5%	1.6%
New York Hospital Queens	1.5%	0.6%
Englewood Hospital	1.3%	1.3%
UMDNJ	1.2%	1.0%
Jersey Shore University Medical Center	1.2%	1.8%
Greenwich Hospital	1.1%	1.9%
Stamford Hospital	1.1%	1.7%
Ocean Medical Center	0.9%	1.0%
New York-Presbyterian Hospital	0.9%	2.6%
New York University Langone Medical ..	0.8%	1.2%
Lenox Hill Hospital	0.8%	0.9%
St. Barnabas Hospital	0.8%	0.6%
Beth Israel Medical Center (Newark)	0.7%	0.3%
Riverview Medical Center	0.6%	1.0%
Memorial Sloan-Kettering Cancer Center	0.5%	1.1%
Westchester Medical Center	0.5%	1.0%
Norwalk Hospital	0.4%	1.3%
White Plains Hospital Center	0.4%	1.1%
Griffin Hospital	0.3%	0.4%
Community Medical Center	0.2%	0.7%

What is the medication utilization of the Medicaid/Uninsured Population?

Patient Profiler

Health Needs: Medications

Audience

Medicaid/Uninsured

Prescriptions
Stores bought past 30 days

	% Population	Suffolk County, NY
Any drug store	73.5%	82.8%
CVS	33.4%	34.3%
Did not buy	26.5%	17.2%
Walgreens	14.7%	15.1%
By mail order	8.4%	13.9%
Walmart	5.2%	4.0%
Target	1.3%	2.6%

Prescriptions
Amount Spent Past 3 Months

	% Population	Suffolk County, NY
Less Than $50	11.2%	13.6%
$100 - $249	6.5%	10.6%
$50 - $99	4.8%	11.5%
$250 - $499	2.6%	4.8%
$500 - $749	1.1%	1.2%
$1000 Or More	0.6%	1.1%
$750 - $999	0.0%	0.4%

OTC
Amount Spent Past 3 Months

	% Population	Suffolk County, NY
Less Than $50	17.8%	27.1%
$50 - $99	12.7%	15.8%
$100 - $249	4.2%	7.6%
$250 - $499	0.6%	1.5%
$1000 Or More	0.1%	0.2%
$750 - $999	0.1%	0.0%
$500 - $749	0.1%	0.4%

RX Brands
Last 12 Months

	% Population	Suffolk County, NY
Lipitor	3.1%	5.5%
Synthroid	2.9%	5.0%
Nexium	1.9%	5.4%
Advair	1.8%	2.5%
Zoloft	1.6%	1.7%
Singulair	1.5%	2.3%
Nasonex	1.5%	1.7%

OTC Brands
Last 12 Months

	% Population	Suffolk County, NY
Advil	43.7%	42.4%
Tylenol	42.2%	40.9%
Band Aid	36.7%	34.8%
Neosporin	33.3%	33.6%
Vicks	25.4%	25.2%
Tums	25.1%	22.1%
Benadryl	23.2%	19.5%
Mucinex	22.2%	19.9%
Aleve	21.5%	21.7%
One-A-Day	17.7%	16.6%
Robitussin	17.5%	17.5%
Bayer	16.6%	21.4%
Alka-Seltzer	14.9%	12.7%
Sudafed	14.5%	10.9%
Motrin	14.0%	10.0%
Claritin	13.4%	13.0%
Icy Hot	12.9%	13.0%

What is the medication utilization of the Medicaid/Uninsured Population?

Patient Profiler

Optimization: Activities

Audience

Medicaid/Uninsured

Commuting Time

Alternative Transportatio

Roads Traveled

past 7 days

Time Spent Working

	% Population	Suffolk County, NY
Driver's License - Currently Have?: Yes	71.6%	89.3%
30 - 59 minutes	15.7%	15.1%
20 - 29 minutes	14.4%	11.5%
Less than 10 minutes	12.4%	11.6%
One hour or more	10.4%	9.0%
10 - 19 minutes	9.5%	12.3%
Subway	15.0%	13.6%
Bus		
MTA New York City Transit ..	7.6%	8.1%
New Jersey Transit train (c..		
Bicycle	5.6%	6.1%
Carpool		
Metro-North	4.4%	4.1%
LIRR (Long Island Rail Roa..		
New Jersey Transit bus	2.2%	2.9%
PATH		
Ferry	1.0%	1.5%
Light rail		
Amtrak	0.3%	1.2%

	% Population	Suffolk County, NY
Local/surface streets mostly	42.7%	41.2%
I-95		
Garden State Parkway	22.0%	24.6%
Long Island Expressway		
New Jersey Turnpike	18.7%	17.5%
I-287		
Route 1	13.4%	15.6%
Route 9		
I-80	11.2%	13.9%
Beltway Parkway/Shore Par..		
I-278	8.9%	7.6%
I-84		
Route 110	8.8%	5.8%
FDR Drive		
George Washington Bridge	7.3%	8.4%
Route 17		
I-87	6.9%	
I-78		10.4%
Route 9W	6.6%	
Merritt Parkway		7.8%
Lincoln Tunnel	5.8%	
Route 46		7.7%
Route 22	5.4%	
West Side Highway/Henry ..		5.2%
Route 4	5.2%	
Holland Tunnel		4.4%
Hutchinson River Parkway	5.1%	
Route 3		4.4%
Manhattan Bridge	4.2%	
Route 35		6.1%
Taconic State Parkway	4.1%	
Queens-Midtown Tunnel		
I-280	3.3%	5.3%
Route 440		
Route 21	3.0%	3.3%
I-684		
Harlem River Drive	2.7%	3.0%
Route 18		
Queensboro Bridge	2.4%	2.3%
I-678		
Route 10	1.7%	2.5%
Route 37		

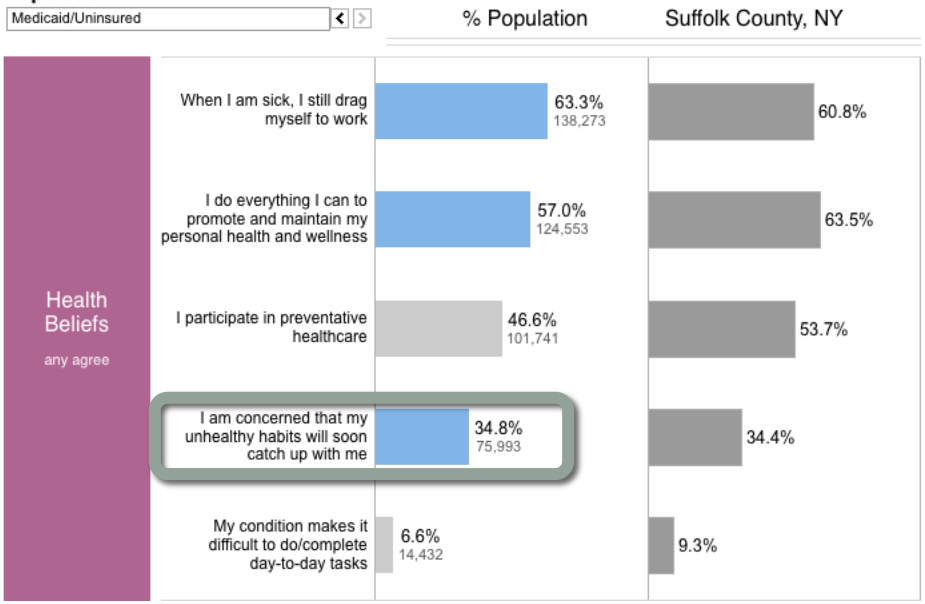
8 Hours or More	31.0%	35.0%
5 Hours To Under 8 Hours	47,117	
2 Hours To Under 5 Hours		8.3%
30 Minutes To Under 1 Hour	3.0%	2.5%
1 Hour To Under 2 Hours	4,559	

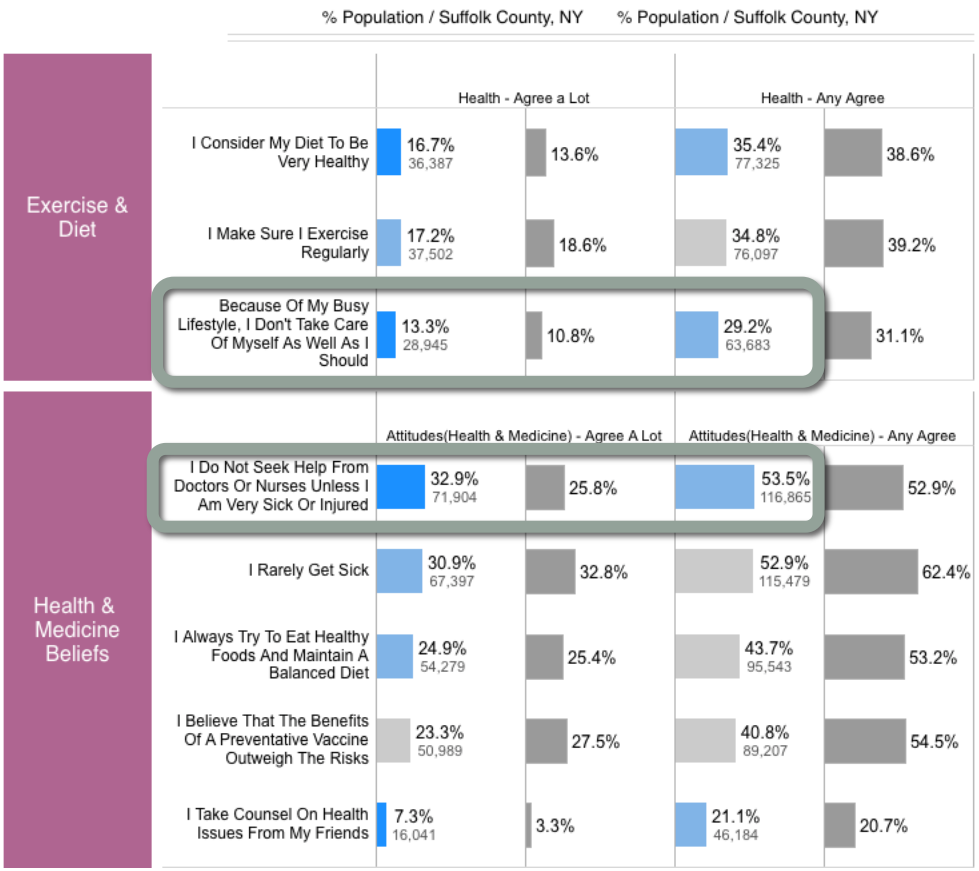
What does this population believe about their health and use of health care resources?

Optimization: Health Beliefs

Population

Medicaid/Uninsured





How Does the Medicaid/Uninsured Population Prefer to Communicate?

Engagement: Communication

Population

Medicaid/Uninsured

Social Media frequency

	% Population	Suffolk County, NY
	22.0% 48,082	21.9%
1 to 2 Times A Day	11.5% 25,225	13.0%
4 - 6 Times A Week	4.6% 10,075	5.4%
Less Than Once A Week	4.2% 9,215	4.1%
1 - 3 Times A Week	2.6% 5,717	4.7%

Communication Methods

	% Population / Suffolk County, NY		% Population / Suffolk County, NY	
	Colleagues	Associates	Friends	
In Person/ Face-to-face	45.3% 68,735	60.1%	59.2% 89,821	59.4%
E-mail	24.7% 37,550	41.0%	58.5% 88,832	68.4%
Text Or Multimedia Message	10.9% 16,563	16.0%	44.2% 67,154	42.7%
Social Networking	7.4% 11,230	9.1%	37.9% 57,583	37.4%
Landline Phone	6.8% 10,286	10.9%	19.6% 29,786	28.5%
Instant Messenger	2.3% 3,537	4.0%	12.0% 18,156	10.9%
Blogs	1.8% 2,785	1.5%	3.6% 5,524	2.5%

Hours Spent per week

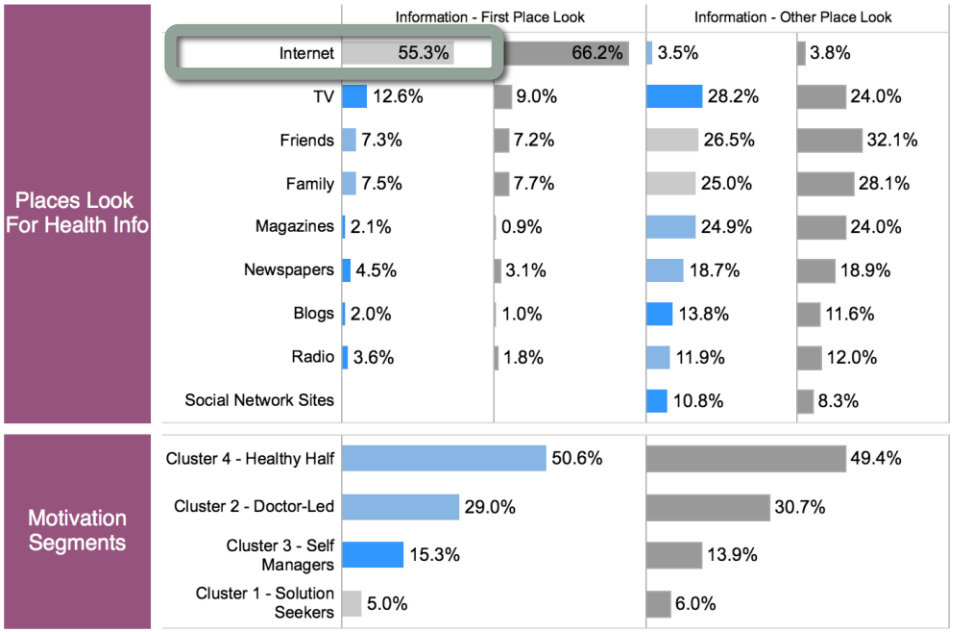
	30 Minutes To Under 1 Hour		1 Hour To Under 2 Hours		2 Hours To Under 5 Hours		5 Hours To Under 8 Hours		8 Hours or More	
Emailing	18.2% 27,663	20.2%	13.4% 20,285	15.5%	6.0% 9,056	8.3%	3.4% 5,101	2.9%	1.3% 1,947	1.7%
Talking on Cell/Smartphone	13.2% 20,063	19.4%	10.9% 16,502	10.8%	11.5% 17,398	5.9%	4.1% 6,188	2.1%	6.0% 9,145	3.5%
Talking on Landline	7.2% 10,990	10.8%	3.6% 5,447	5.8%	2.0% 2,980	2.0%	7.5% 11,344	3.0%	0.8% 1,244	0.4%
Texting/MM Messaging	9.5% 14,465	7.9%	5.8% 8,734	6.2%	9.8% 14,889	5.2%	2.0% 3,107	1.0%	9.0% 13,666	5.0%

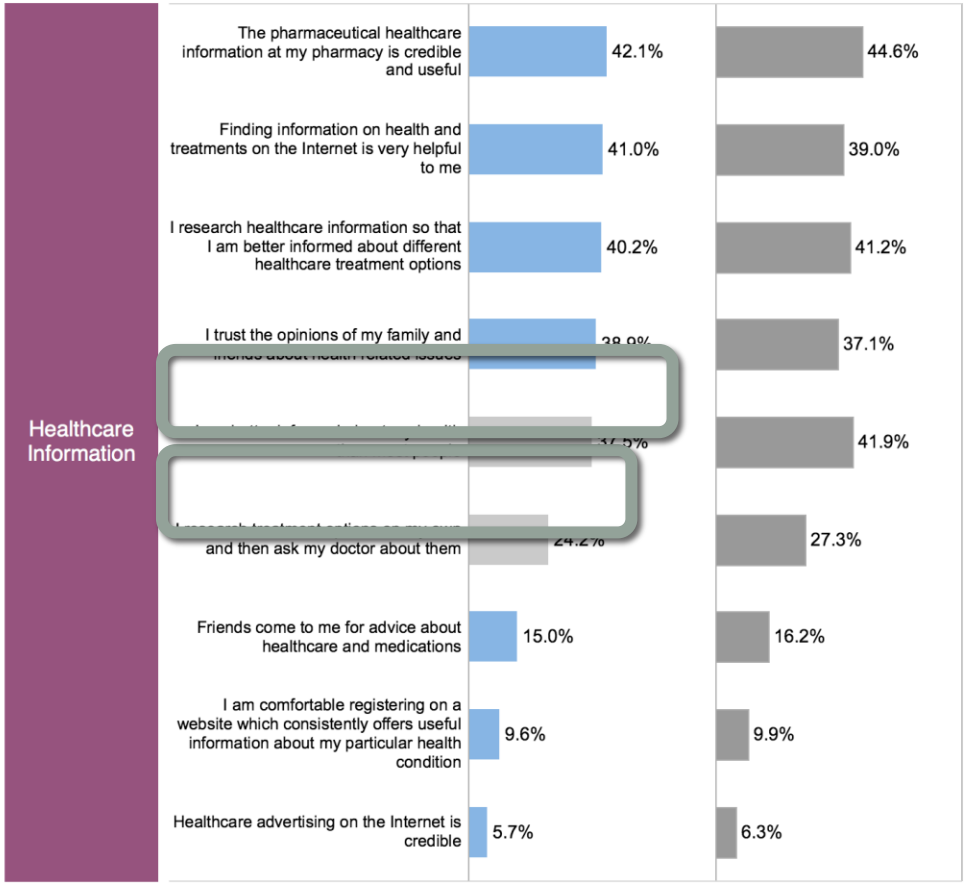
How Does this Population Take Control of Their Own Health Education?

Engagement: Health Education

Population

Medicaid/Uninsured





Are Healthcare Ads a Motivator for this Population?

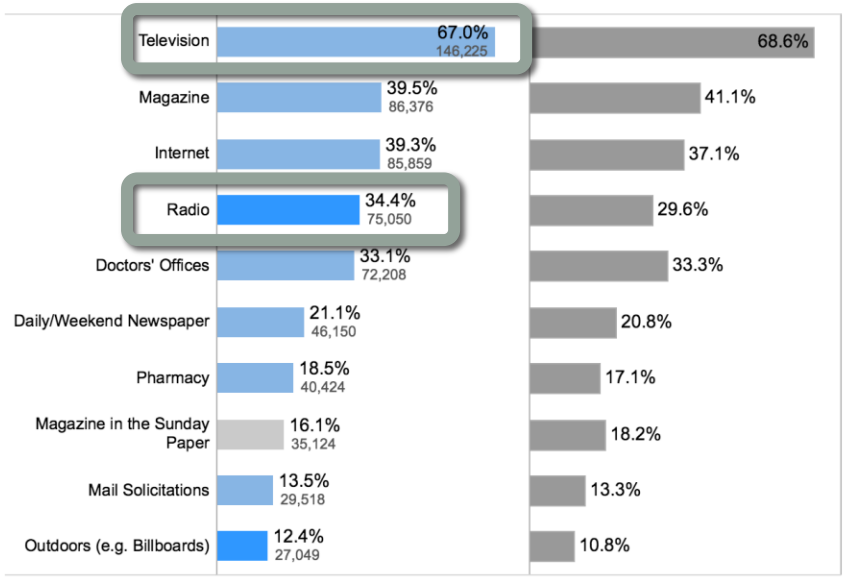
Engagement: Marketing

Population

Medicaid/Uninsured

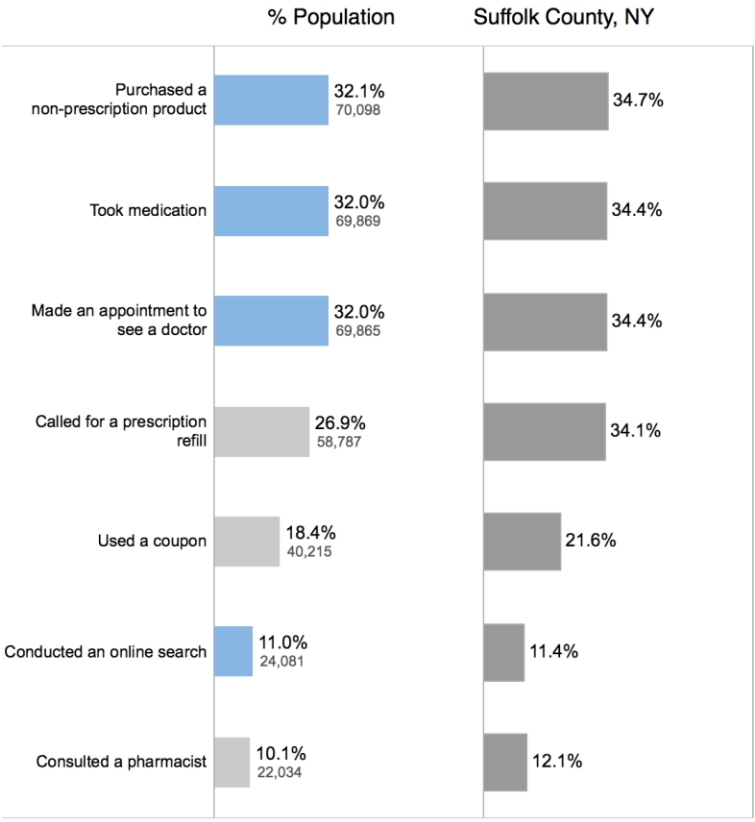
Place Saw Healthcare Ads

Past 12 Months



Actions taken due to Healthcare Ads

Past 12 Months



How does this population use digital devices?

Engagement: Digital Engagement

Population

Medicaid/Uninsured

Digital Connections

	% Population	Suffolk County, NY
Own A Cell Phone/Smartphone	92.9%	96.7%
Android	25.7%	23.8%
IOS (Iphone)	13.8%	24.9%
Blackberry Os	0.9%	1.5%
Windows Phone	0.9%	1.5%
Downloaded Apps On Cell/Smartphone Device	38.9%	35.0%
Smartphone (iPhone, Galaxy, etc.)	74.8%	70.0%
Tablet (iPad, Galaxy Tab, Kindle Fire, etc.)	69.6%	61.7%

App Activities

	% Population	Suffolk County, NY
Taken Photos	26.7%	24.4%
Accessed The Internet	24.4%	22.9%
Sent Or Received Personal E-mail	21.9%	22.3%
Accessed Your Social Networking Account	19.6%	18.1%
Listened To Music Or Other Audio	18.4%	16.2%
Played Games	18.0%	17.0%
Upload Pics/Vid Social Net/Photo Share Site	16.1%	14.7%
Accessed GPS	15.9%	18.1%
Listened To Music Streamed To Your Cell/Smartphone	15.3%	12.6%

Digital Psychographic

I Like To Be Connected To My Friends And Family Wherever I Am	53.3%	60.1%
I Use My Cell Phone In Many Different Ways To Get The Information I Need	46.9%	53.6%
I Only Use My Cell Phone For Basic Calling Rather Than Any Other Features	31.3%	30.4%
I Rely On My Cell Phone To Keep Up With News Or Sports	24.5%	26.1%
I Use Information From My Cell Phone To Decide Where To Go Or What To Do In My Free Time	23.3%	21.2%
Willing To Accept Advertisements Sent To My Cell Phone If I Received Something Of Value In ..	22.1%	19.2%

DSRIP

- 8 billion dollar grant (Medicaid waiver) from CMS to NY State
  - 25% reduction over five years in avoidable hospitalizations and ER visits in the Medicaid and uninsured population
  - Collaborative effort to implement innovative projects focused on
    - System transformation
    - Clinical improvement
    - Population health improvement

5 Year Goals

- Create integrated Suffolk County care delivery system for 387K lives anchored by safety net providers
- Engage partners across the care delivery spectrum to create a countywide network of care
- After five years, transition this network to an ACO which will contract with insurance providers on an at risk basis

Community Needs Assessment

- Description of Health Care Resources and Community Resources
- Description of the Community Served
  - Demographics of the Population
    - Population Size, Age, Sex and Race/Ethnicity
    - Income, Education and Employment
  - Health Status
    - Leading Cause of Death
    - ER Utilization
    - Mental Health
    - Tobacco Use
    - Cancer
- Service Challenges
- Assets & Resources
- Suffolk County, NY
  - http://tinyurl.com/pdtf564

Pain Points in Population Health

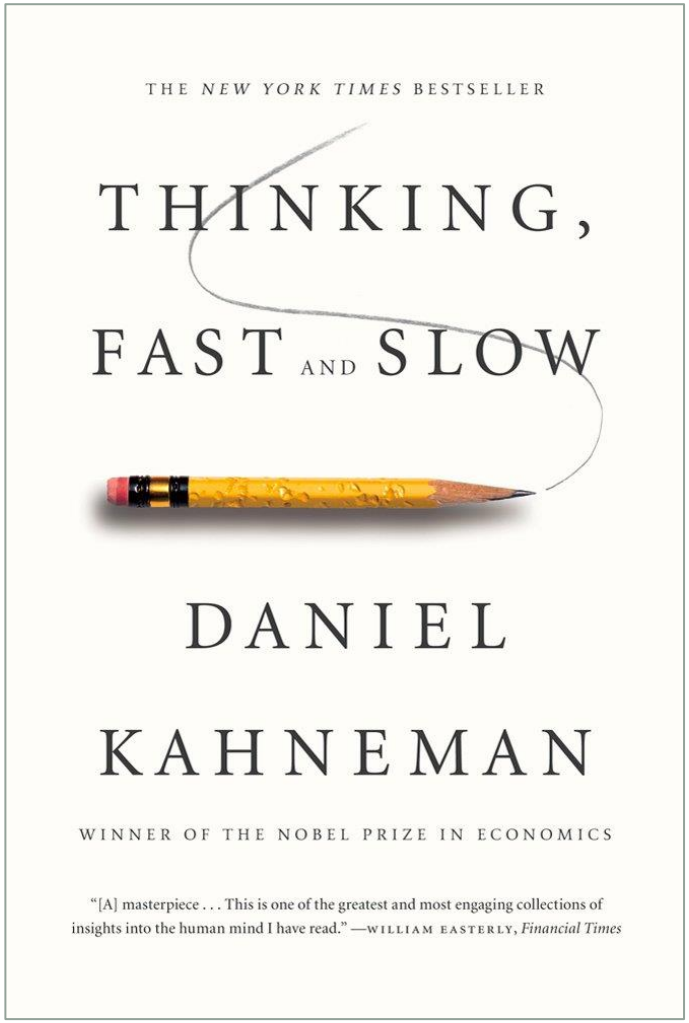
- Registries
  - Definition
  - Data Elements
- Attribution

  Who is in charge?
- Numerators

Understanding Cognition

"The best we can do is a compromise: learn to recognize situations in which mistakes are likely and try harder to avoid significant mistakes when the stakes are high."

Daniel Kahneman



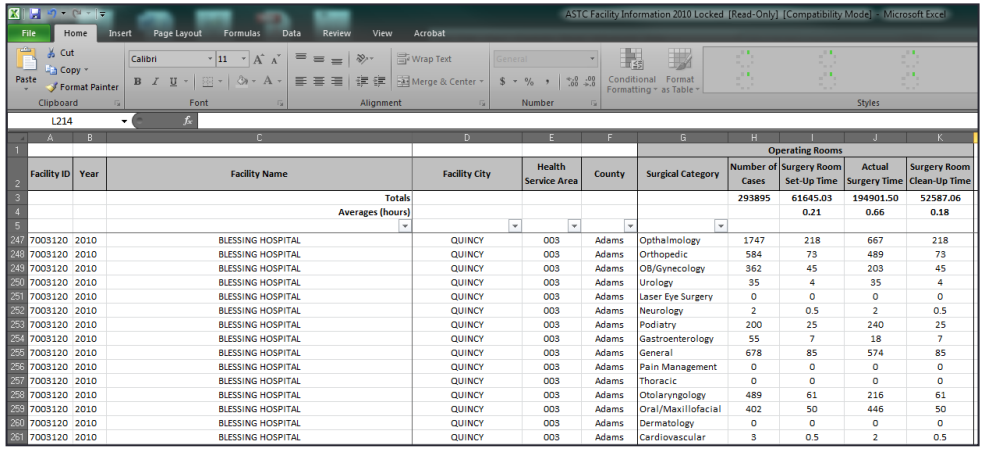
Vision Coupled with Thought

System 1 represents the automatic and intuitive thinking process.

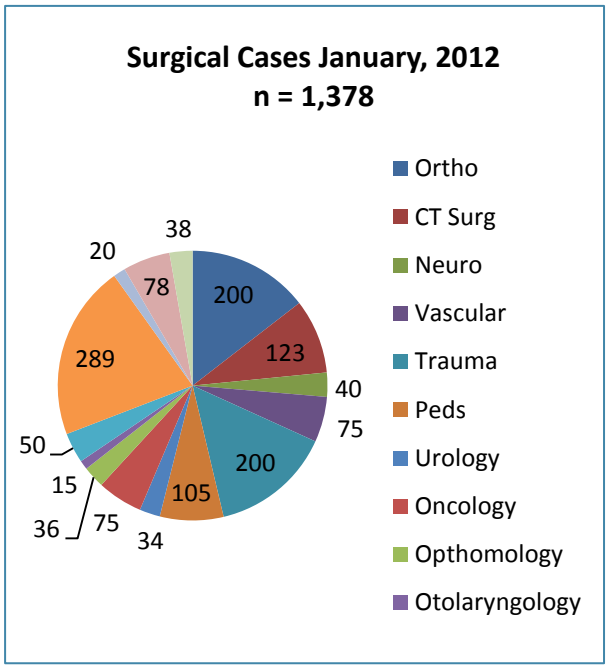
System 2 represents the thinking process that requires effort and attention.

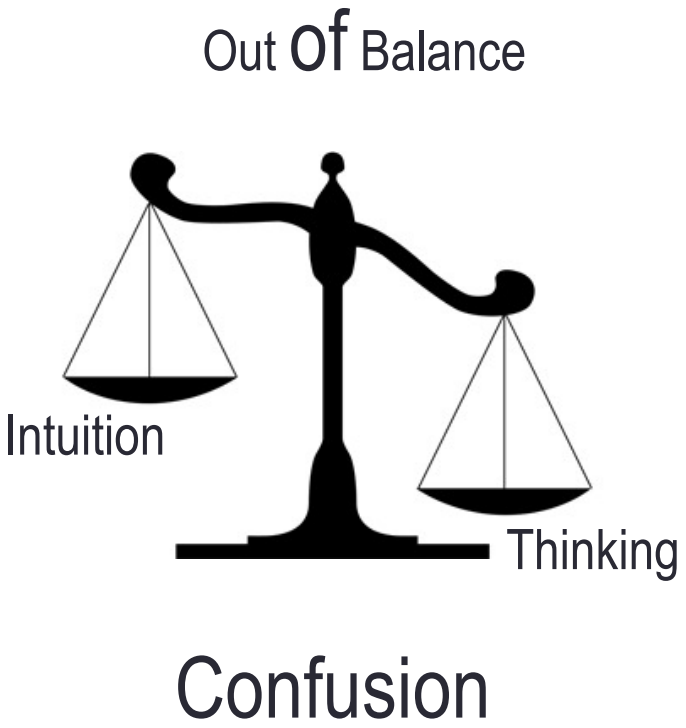
Source: Kahneman, Thinking Fast and Slow, 2011

Data Visualization and Human Perception

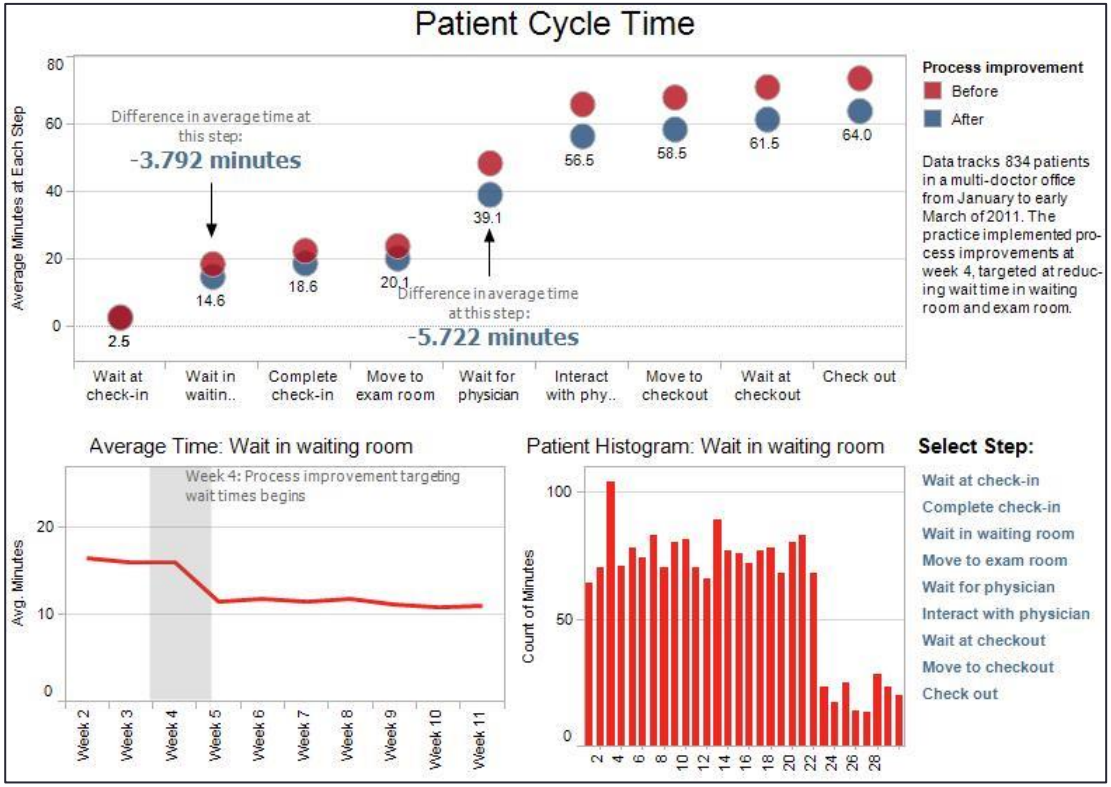


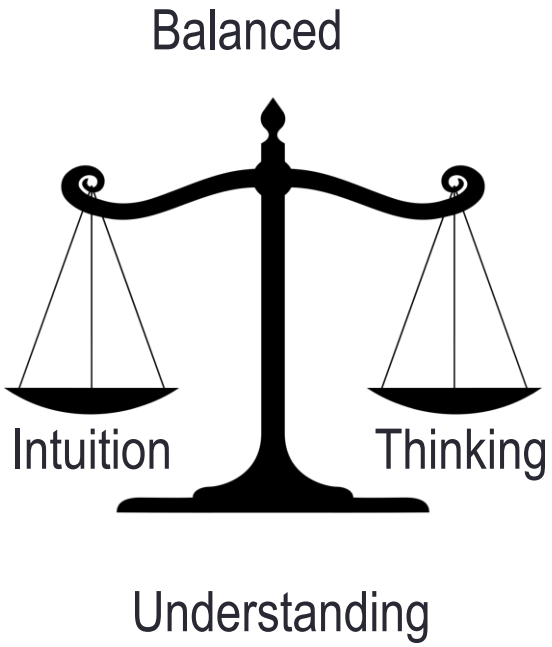
	A	B	C	D	E	F	G	H	I	J	K
1								Operating Rooms			
2	Facility ID	Year	Facility Name	Facility City	Health Service Area	County	Surgical Category	Number of Cases	Surgery Room Set-Up Time	Actual Surgery Time	Surgery Room Clean-Up Time
3			Totals					293895	61645.03	194901.50	52587.06
4			Averages (hours)						0.21	0.66	0.18
5											
247	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Opthalmology	1747	218	667	218
248	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Orthopedic	584	73	489	73
249	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	OB/Gynecology	362	45	203	45
250	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Urology	35	4	35	4
251	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Laser Eye Surgery	0	0	0	0
252	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Neurology	2	0.5	2	0.5
253	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Podiatry	200	25	240	25
254	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Gastroenterology	55	7	18	7
255	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	General	678	85	574	85
256	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Pain Management	0	0	0	0
257	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Thoracic	0	0	0	0
258	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Otolaryngology	489	61	216	61
259	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Oral/Maxillofacial	402	50	446	50
260	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Dermatology	0	0	0	0
261	7003120	2010	BLESSING HOSPITAL	QUINCY	003	Adams	Cardiovascular	3	0.5	2	0.5



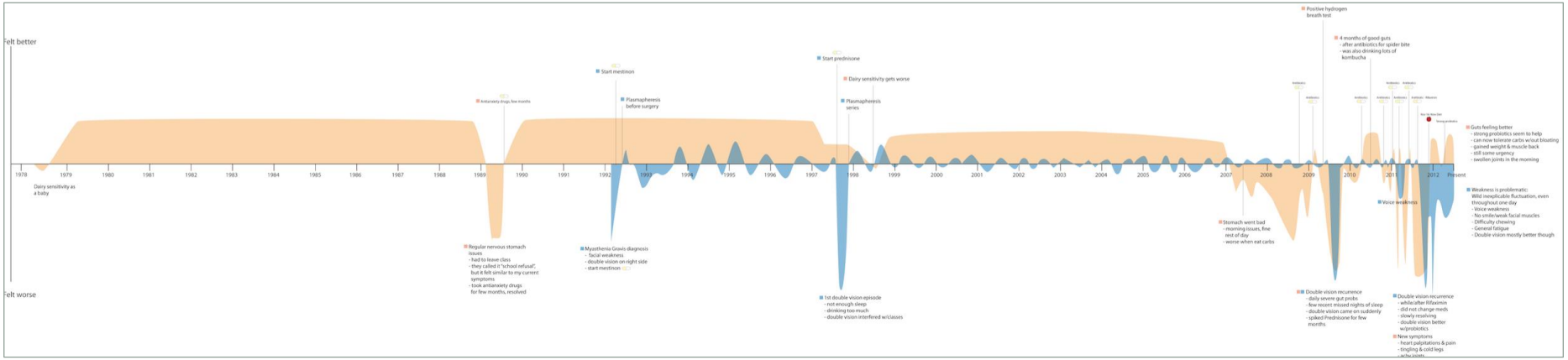


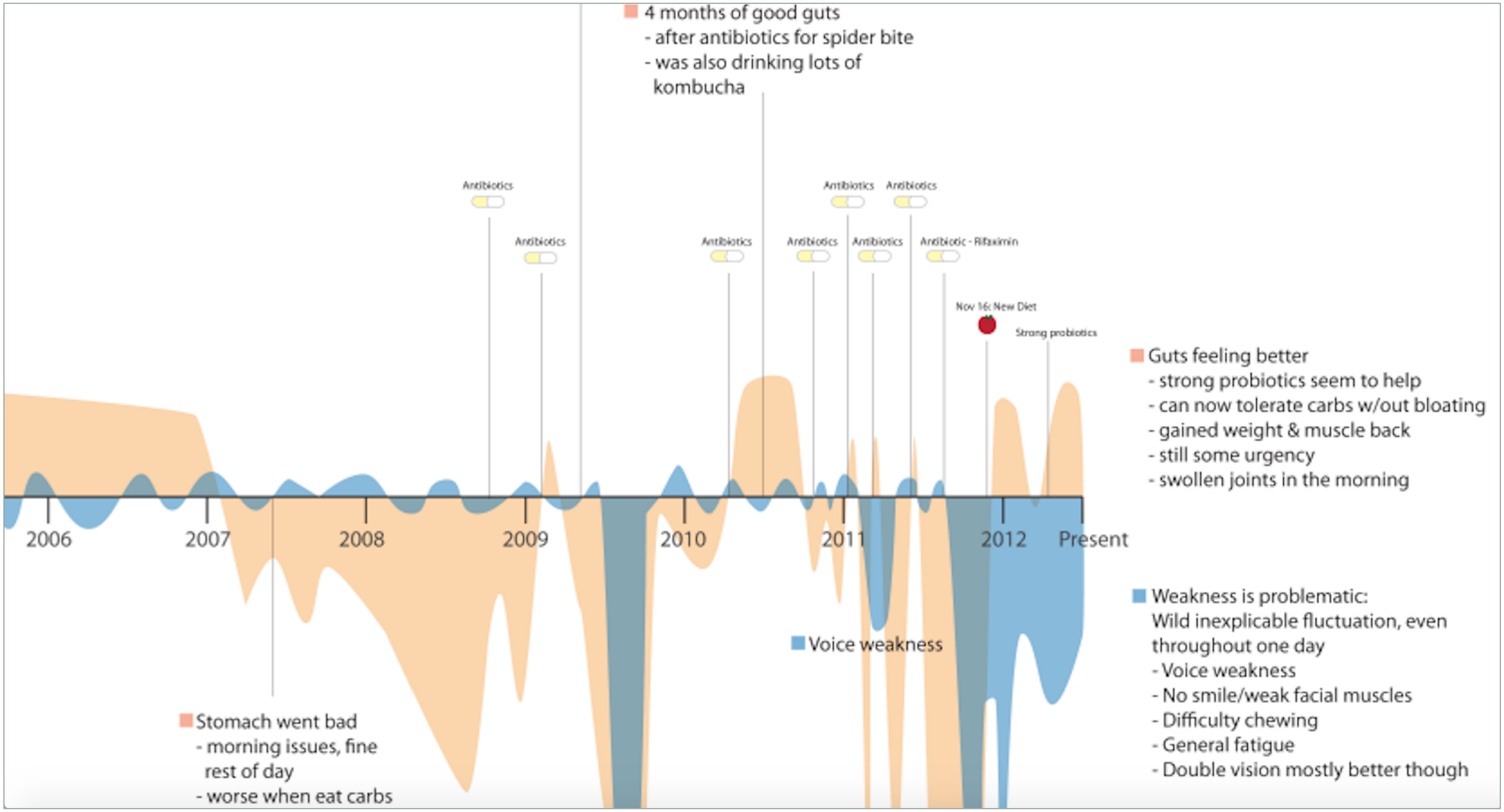
Data Visualization and Human Perception

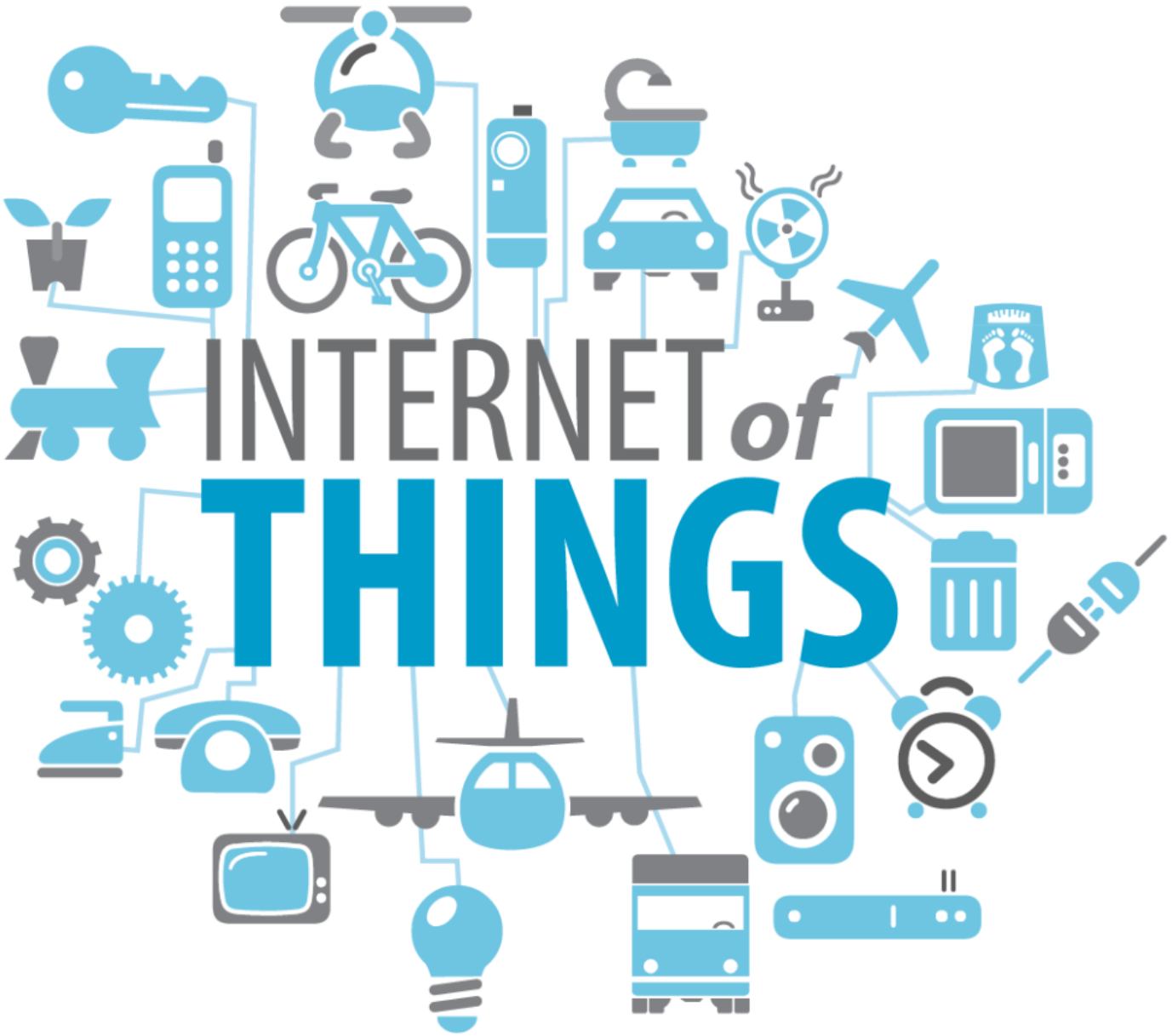




Longitudinal View for Care Coordination




4 months of good guts
- after antibiotics for spider bite
- was also drinking lots of kombucha
Antibiotics
Antibiotics
Antibiotics
Antibiotics
Antibiotics
Antibiotics
Antibiotics
Antibiotic - Rifaximin
Nov 16: New Diet
Strong probiotics
2006
2007
2008
2009
2010
2011
2012
Present
Guts feeling better
- strong probiotics seem to help
- can now tolerate carbs w/out bloating
- gained weight & muscle back
- still some urgency
- swollen joints in the morning
Voice weakness
Weakness is problematic:
Wild inexplicable fluctuation, even throughout one day
- Voice weakness
- No smile/weak facial muscles
- Difficulty chewing
- General fatigue
- Double vision mostly better though
Stomach went bad
- morning issues, fine rest of day
- worse when eat carbs

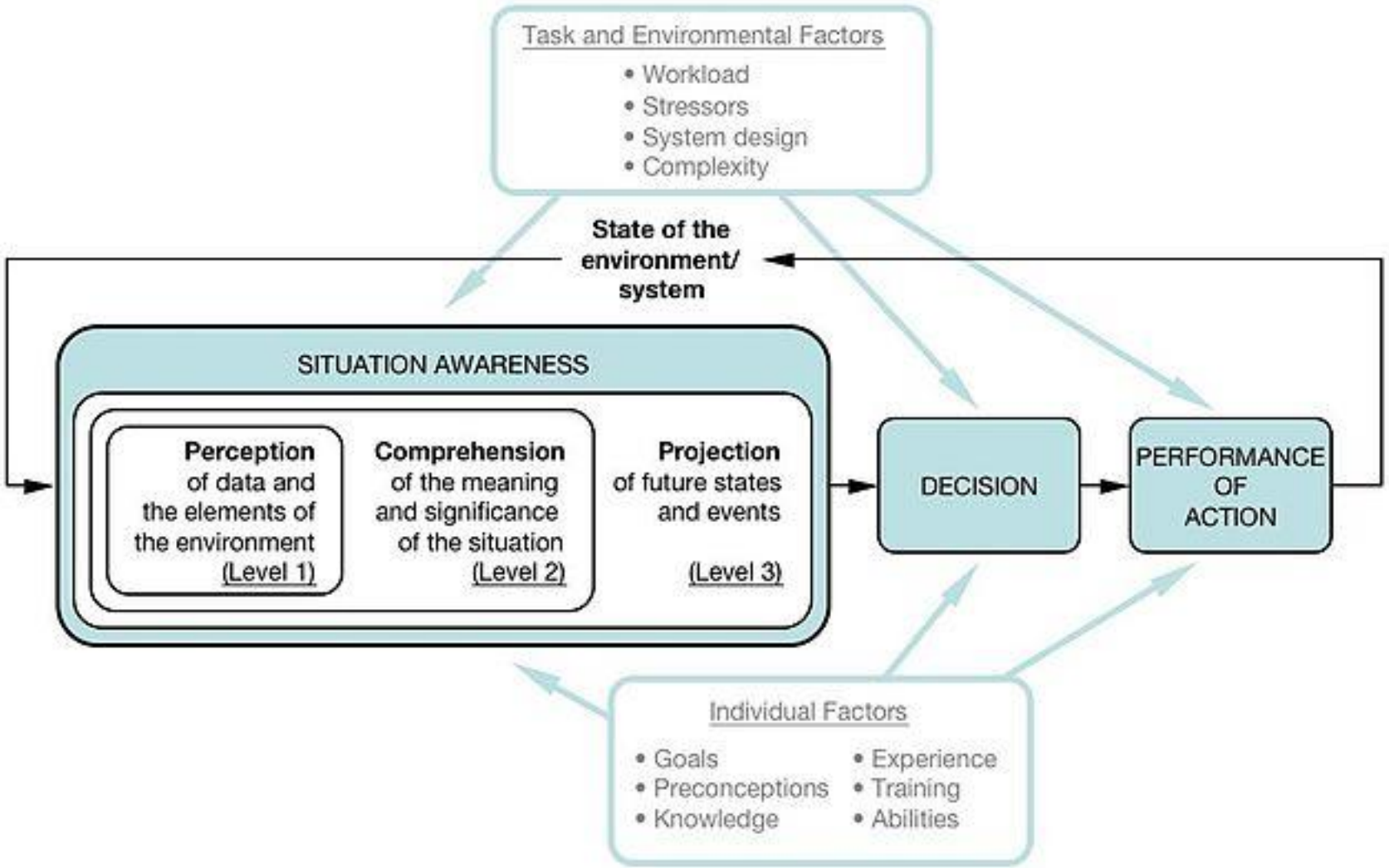

INTERNET of
THINGS

Situational Awareness Defined

Situation Awareness (**SA**) is the perception of environmental elements with respect to time or space, the comprehension of their meaning, and the projection of their status after some variable has changed, such as time, or some other variable, such as a predetermined event. It is also a field of study concerned with understanding of the environment critical to decision-makers in complex, dynamic areas from aviation, air traffic control, navigation, military operations, healthcare to more ordinary but nevertheless complex tasks such as driving an automobile or riding a bicycle.

Situational Awareness Defined (cont.)

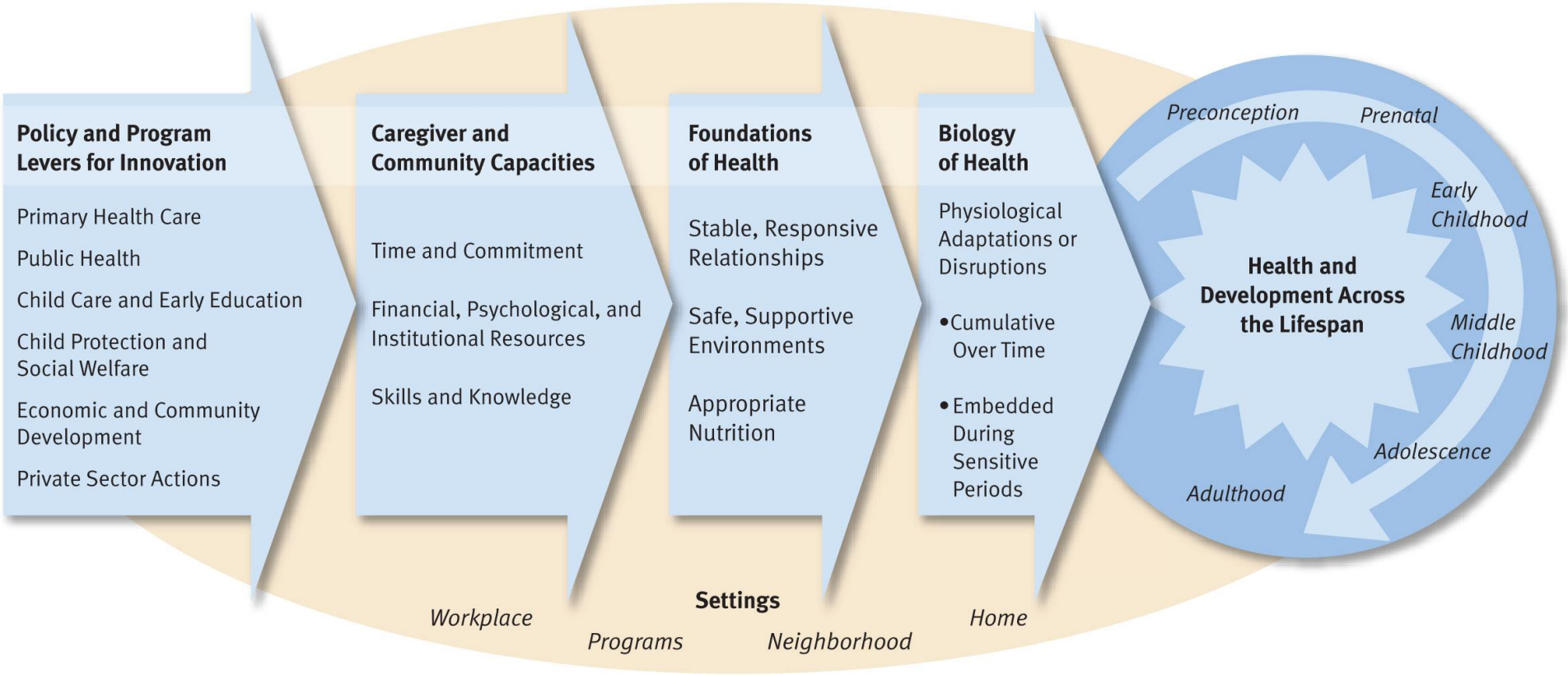
Situation awareness involves being aware of what is happening in the vicinity, in order to understand how information, events, and one's own actions will impact goals and objectives, both immediately and in the near future. One with an adept sense of situation awareness generally has a high degree of knowledge with respect to inputs and outputs of a system, i.e. an innate "feel" for situations, people, and events that play out due to variables the subject can control. Lacking or inadequate situation awareness has been identified as one of the primary factors in accidents attributed to human error. Thus, situation awareness is especially important in work domains where the information flow can be quite high and poor decisions may lead to serious consequences.



Endlsey's model of SA. This is a synthesis of versions she has given in several sources, notably Endsley (1995a) and Endsley et al (2000). Drawn by Dr. Peter Lankton, May 2007.

Environments by Level of Care

- Monitored Inpatient Environments
  - ER
  - OR
  - ICU
  - Step Down
- Inpatient Environments
  - Med/Surg
  - OB
  - Oncology
- Outpatient Environments
  - Clinic
  - Urgent Care
  - Home

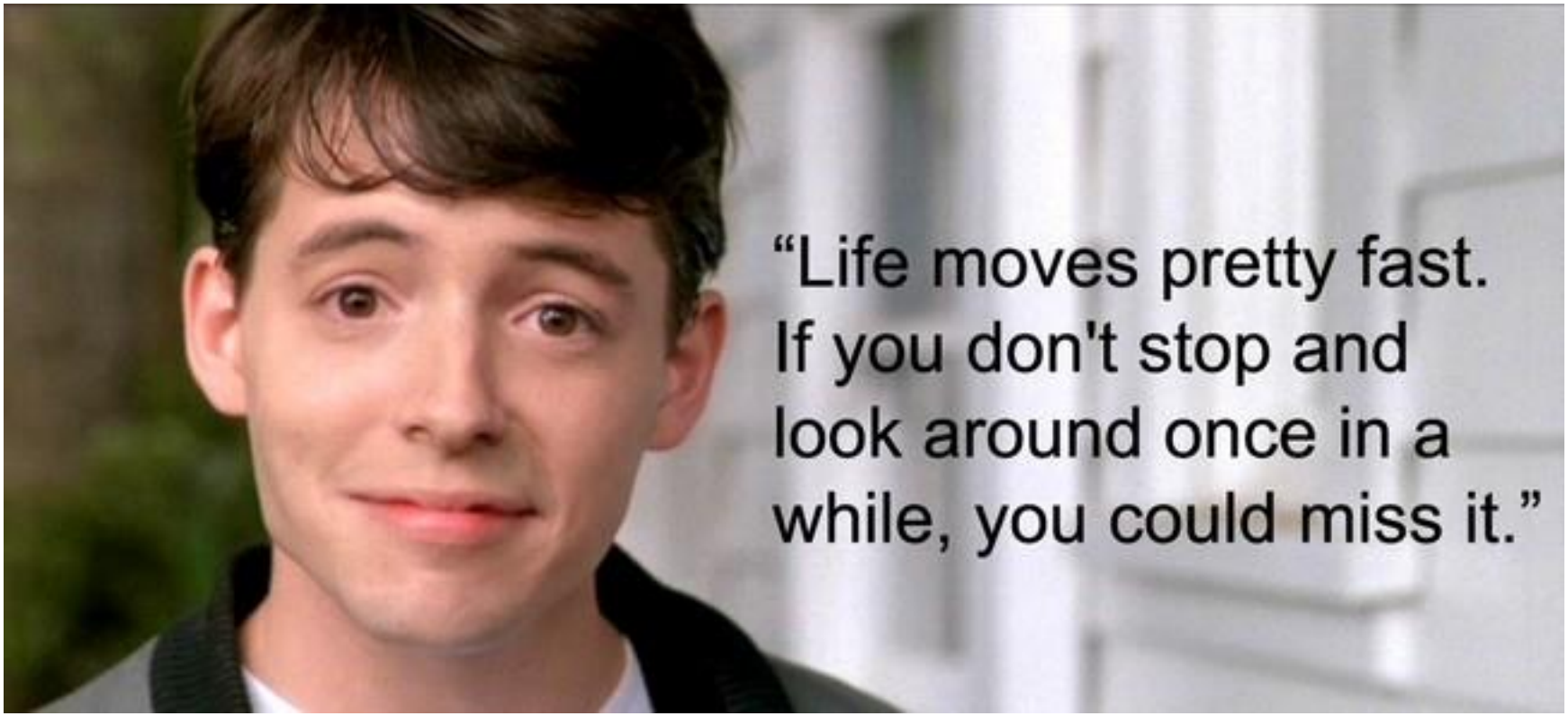


Center for the Developing Child http://developingchild.harvard.edu/

Paradox of Population Health

- Understanding the Patient as a Person
  - Social Determinates
  - Demographic Issues
- A Person's Personal "Big Data"
  - Medical IoT
  - Omics
- High Quality and Value Care at the Personal Level
  - Quality Measures for the Masses
- Making it Personal
  - Access to and Understanding the Longitudinal Record

Miller, B. 2016 https://blog.caradigm.com/2016/01/the-paradox-of-population-health/


“Life moves pretty fast.
If you don't stop and
look around once in a
while, you could miss it.”

Contact Information

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N2InformaticsRN

American Nursing Informatics Association

ANIA

Where caring and technology meet