Toward Personal Health
Going Home and Beyond

October 1, 2014
IOM Future of Home Care

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Patient, Caregiver, & Patient Advocate,
Everyday Life

Have tried to take care “home” for 30 years…

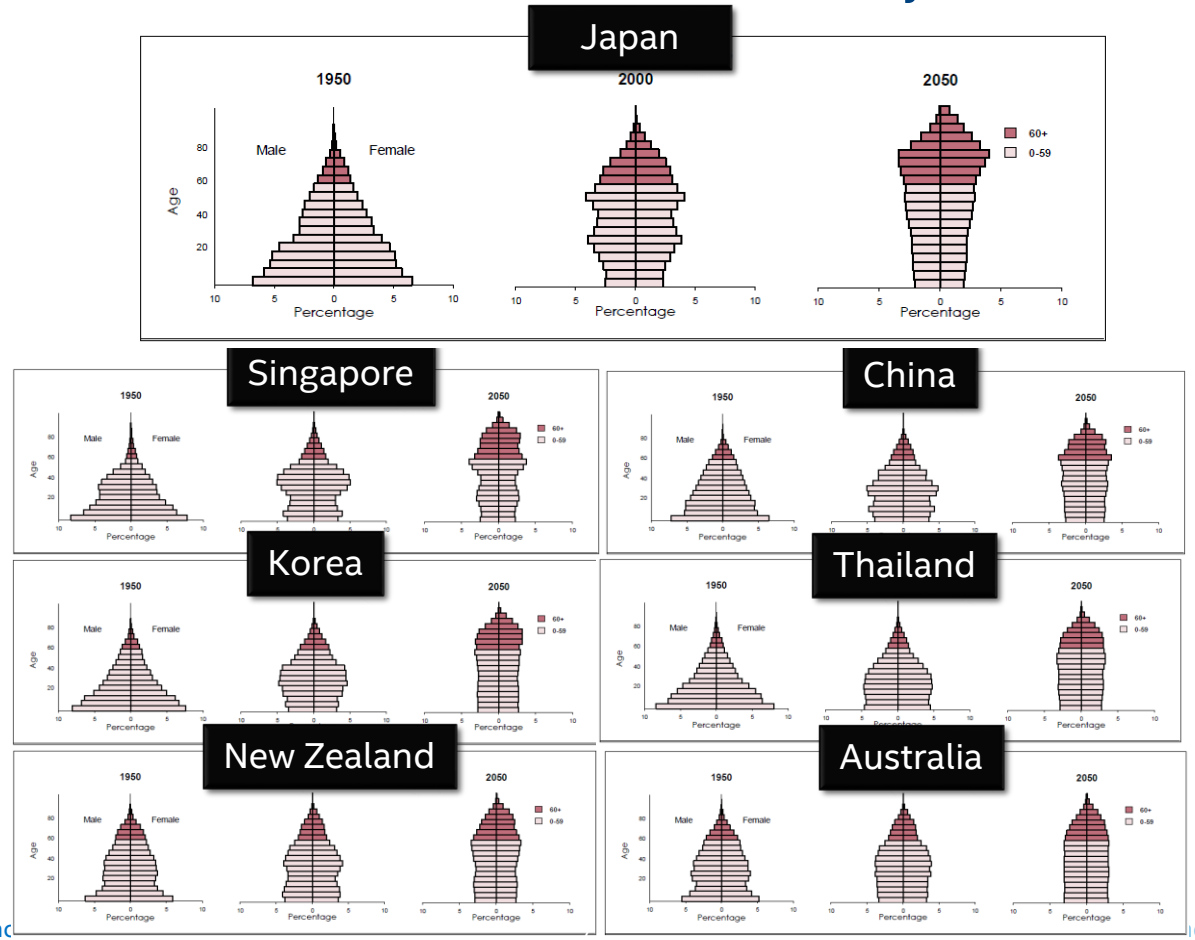
- Caregiver
  - Grandmother with Alzheimer’s = independent living tech, 1984
- Cancer patient
  - Near-death w/ hospital inspection on chemo = home infusion advocacy, 1992

- Academic
  - Study of nursing homes = home care technology startup, 1994
- Corporate R&D
  - Frustration with lack of industry/gov’t focus on aging = non-profit advocacy, 2002
  - Global study of aging and healthcare = cohort studies of aging-in-place for seniors, 2006
  - Prototypes for seniors/chronic patients = telehealth/independent living joint venture, 2010
- Business Executive
  - Frustration with lack of biz model/care model innovation = national reform policies, 2010
  - Global market for home health innovation = China & EU Age Friendly City initiatives, 2012

World can’t wait 30 more years to scale home & community care!

Learning from extremes…

Look to Asia for healthcare invention by extreme necessity

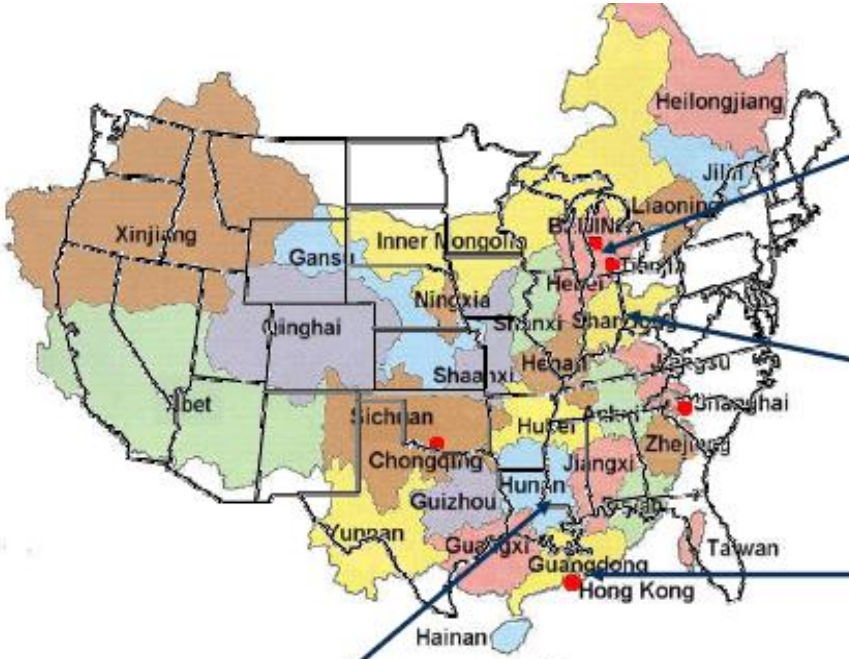


Population Division, DESA, United Nations (2009)

Japan rebuilding care capacity to be distributed to communities / care providers

As they rebuild in the tsunami zone, they are making sure to never again over-rely on only medical mainframes.

China's extreme size, demographics, urbanization



Beijing: 15,380,000 – Capital of China

Belgium: 10,348,276 – Capital of the European Union

Shandong: 92,480,000 – Source of significant portion of the military leadership, rapidly industrializing, home of Confucius.

Germany: 82,424,609 – Industrial engine of Europe

Hong Kong: 6,860,000

Switzerland: 7,450,867
Both financial centers

Hunan: 63,260,000 – largely agricultural with a capital city, Changsha, of nearly 1.6 million inhabitants

France: 60,424,213 – traditionally agricultural with a capital city, Paris, of over 10 million inhabitants

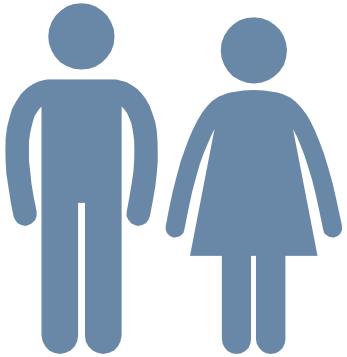
Every year for Chinese New Year, the most important holiday in China, there are around **350,000,000** domestic travellers, which is equal to the population of Europe.

Demographics = rising China healthcare costs/shortages

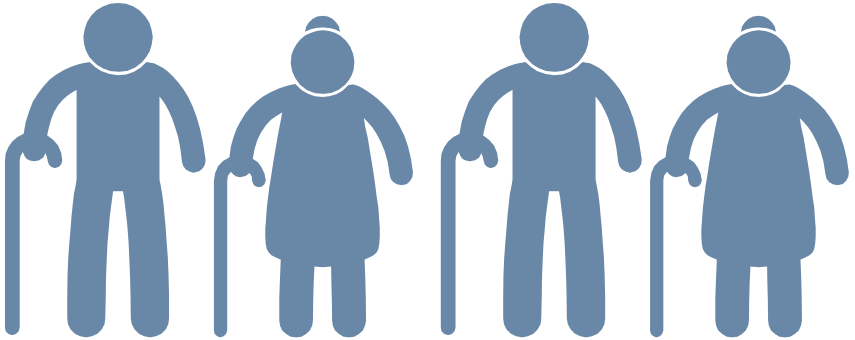
Population Division, DESA, United Nations (2009)

One child policy requiring new care models at home

An average couple



will care for



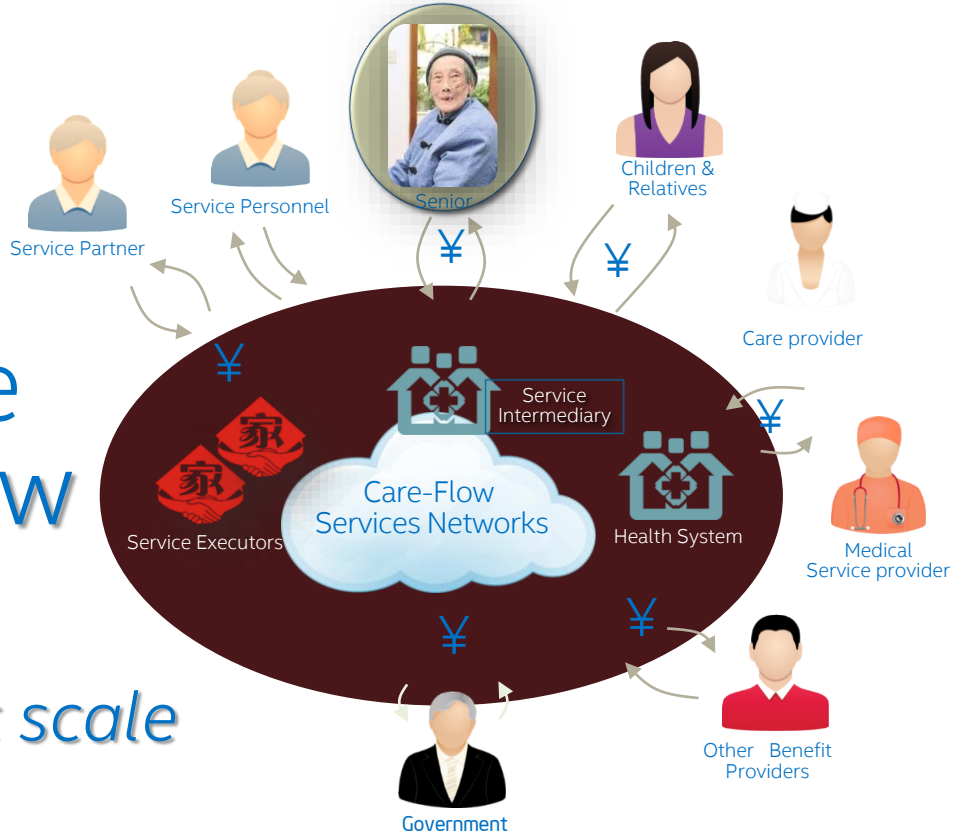
4 older family members due to historic 1-child policy

Intel Age Friendly Cities Initiative focused on China first

Community care workforce, infra, biz models (all ages!)

Facilitate care-flow

Economic scale



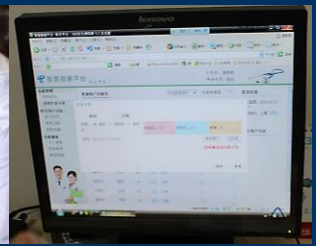
New platforms on “everyday life” tech for whole life services…

1 Daily Living Services

House keeping/food & grocery delivery/ repairing/laundry

2 Health management & medical services

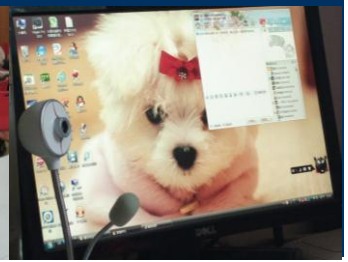
EHR for seniors/chronic disease management/in home medical service



Holistic & Simple experience

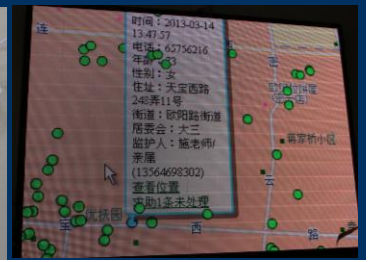
3 Social Engagement Platform

Synchronous/asynchronous communications/ online-offline integration



4 Services for safe & secure living

Benefit distribution/environment monitor & emergency service/anti-lost

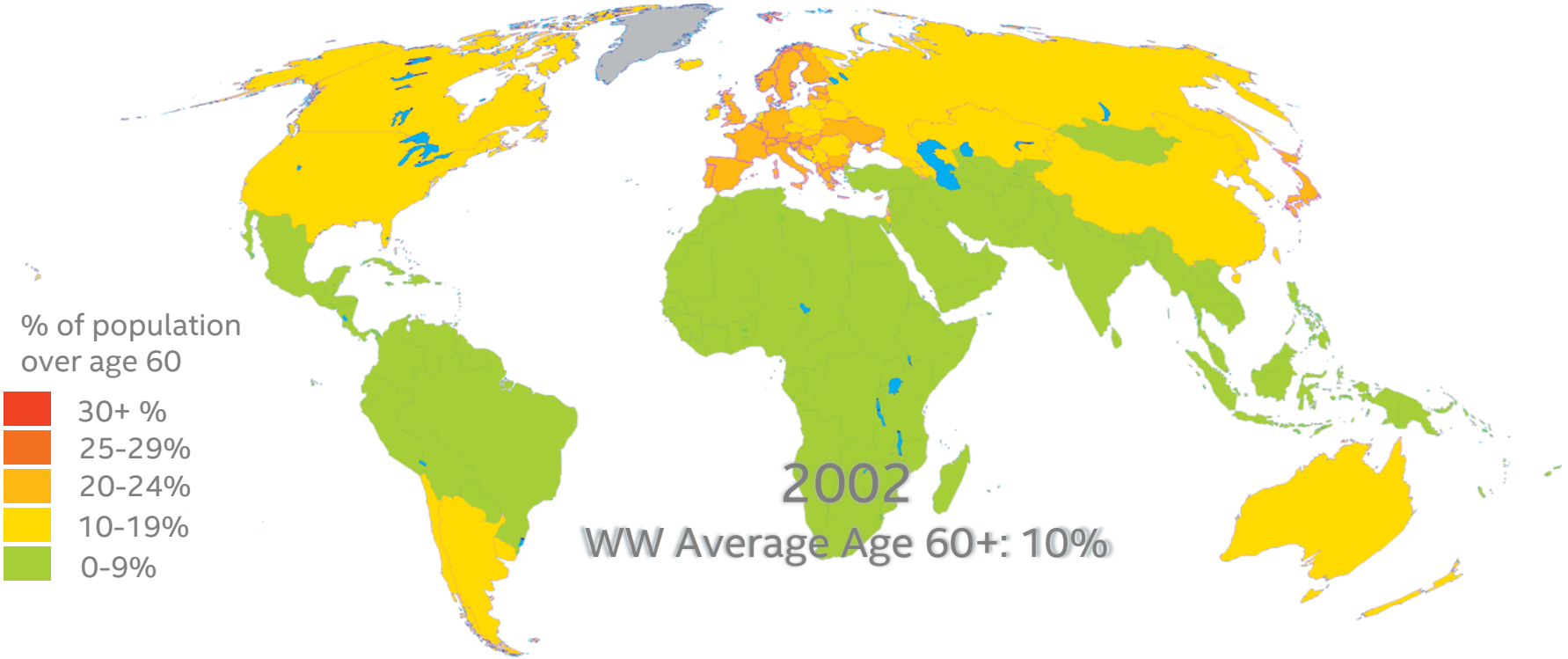


China competing to lead personal health/AFC industry & jobs

By 2020, drive 90% of care for older people to the home! Current 5-year national plan to drive age friendly cities.

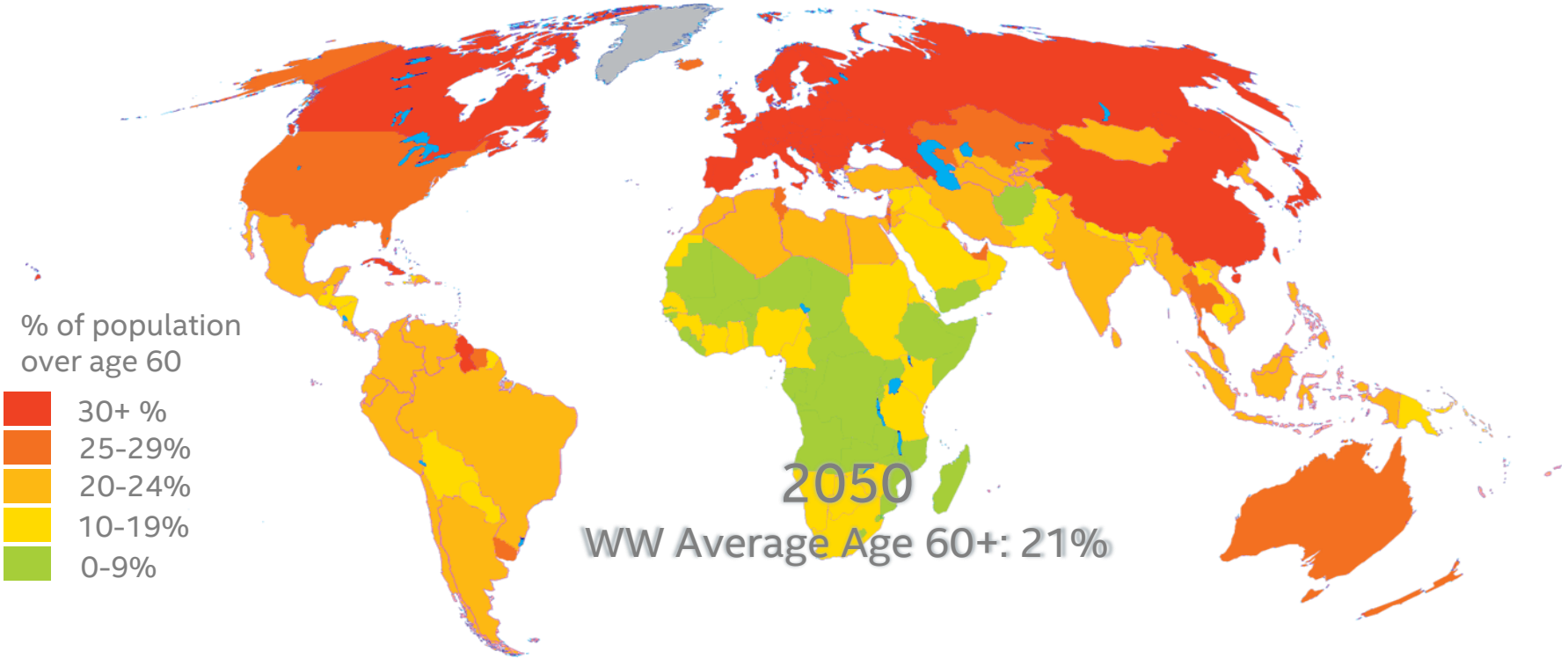
Shifting from mainframe to personal health…

Global Aging: the other inconvenient truth…



Source: United Nations "Population Aging 2002"

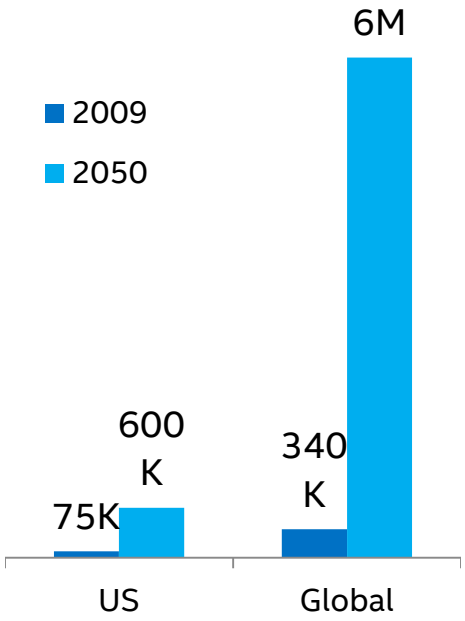
Global Aging: the other inconvenient truth…



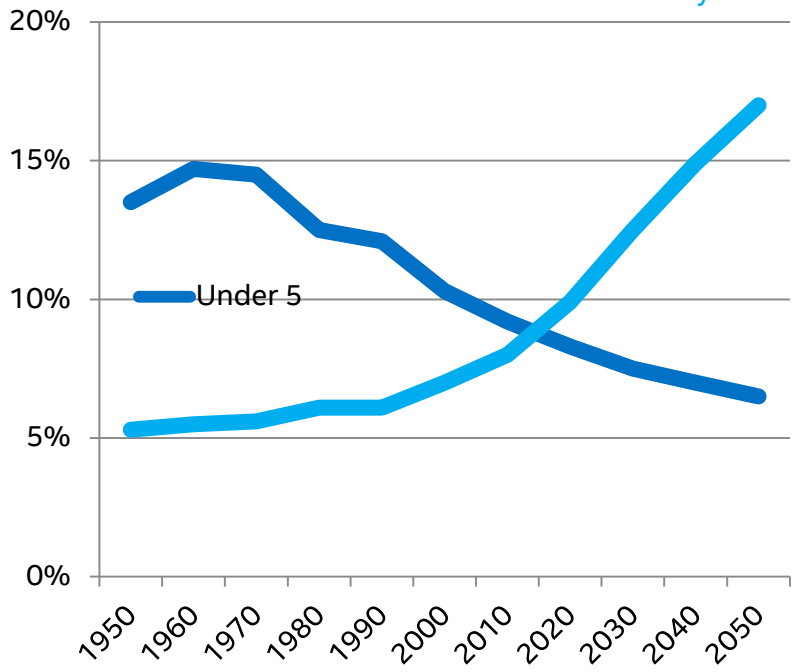
Source: United Nations "Population Aging 2002"

The (crossover) point of no return…

Growth of 100 Year Olds from 2009-2050

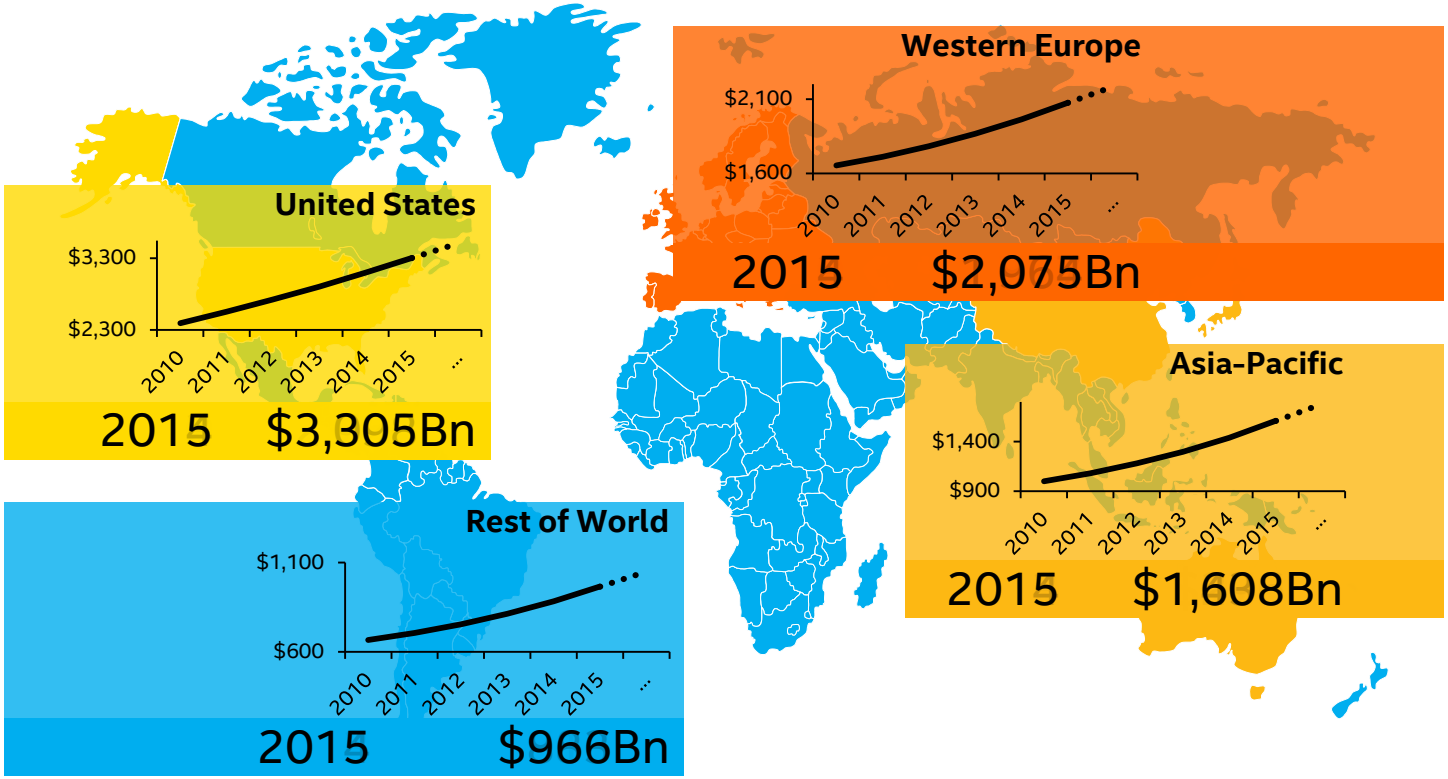


By 2017, there will be more people over 65 than under 5 for the first time in history

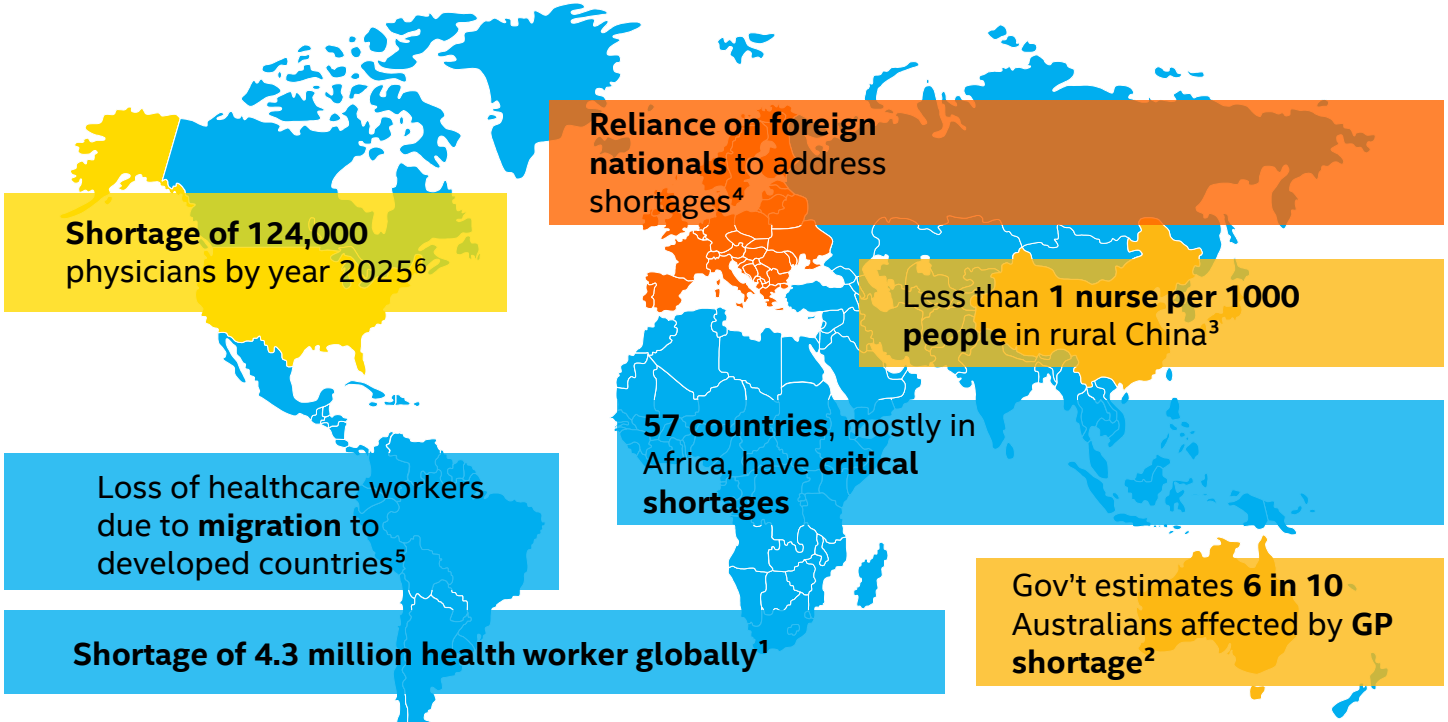


Source: United Nations Department of Economic and Social Affairs 2007b.

Healthcare Costs Rising Worldwide

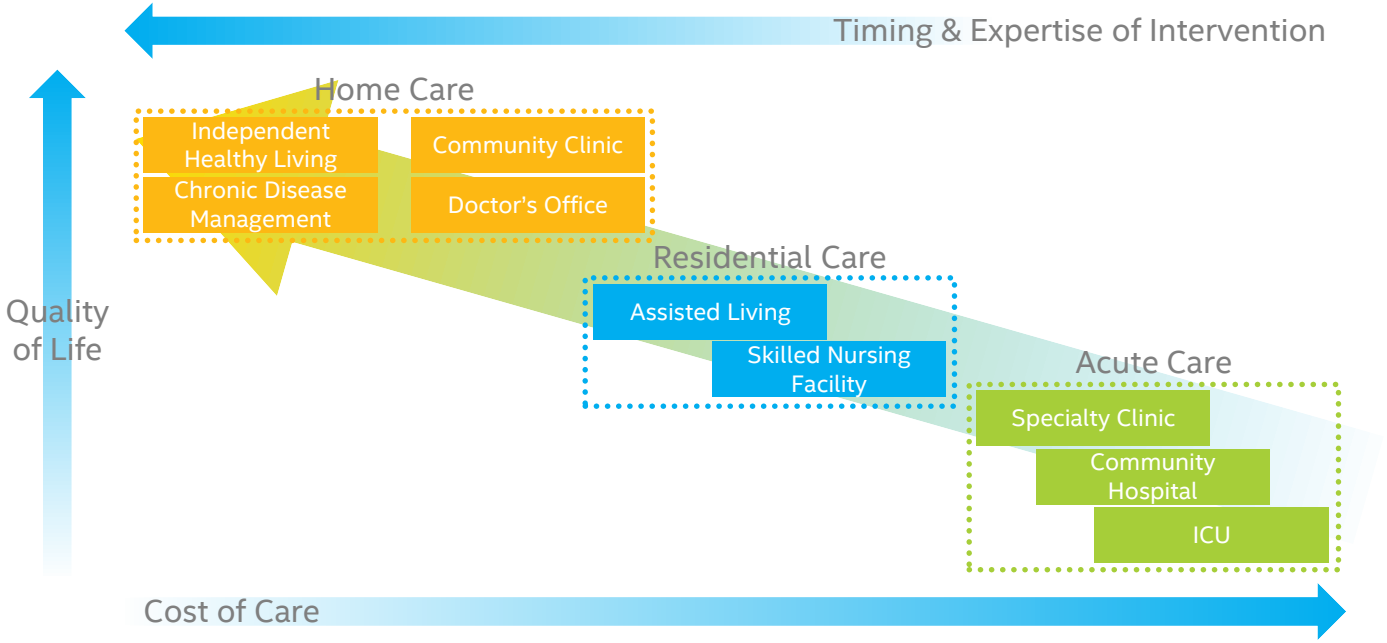


Health Worker Shortage

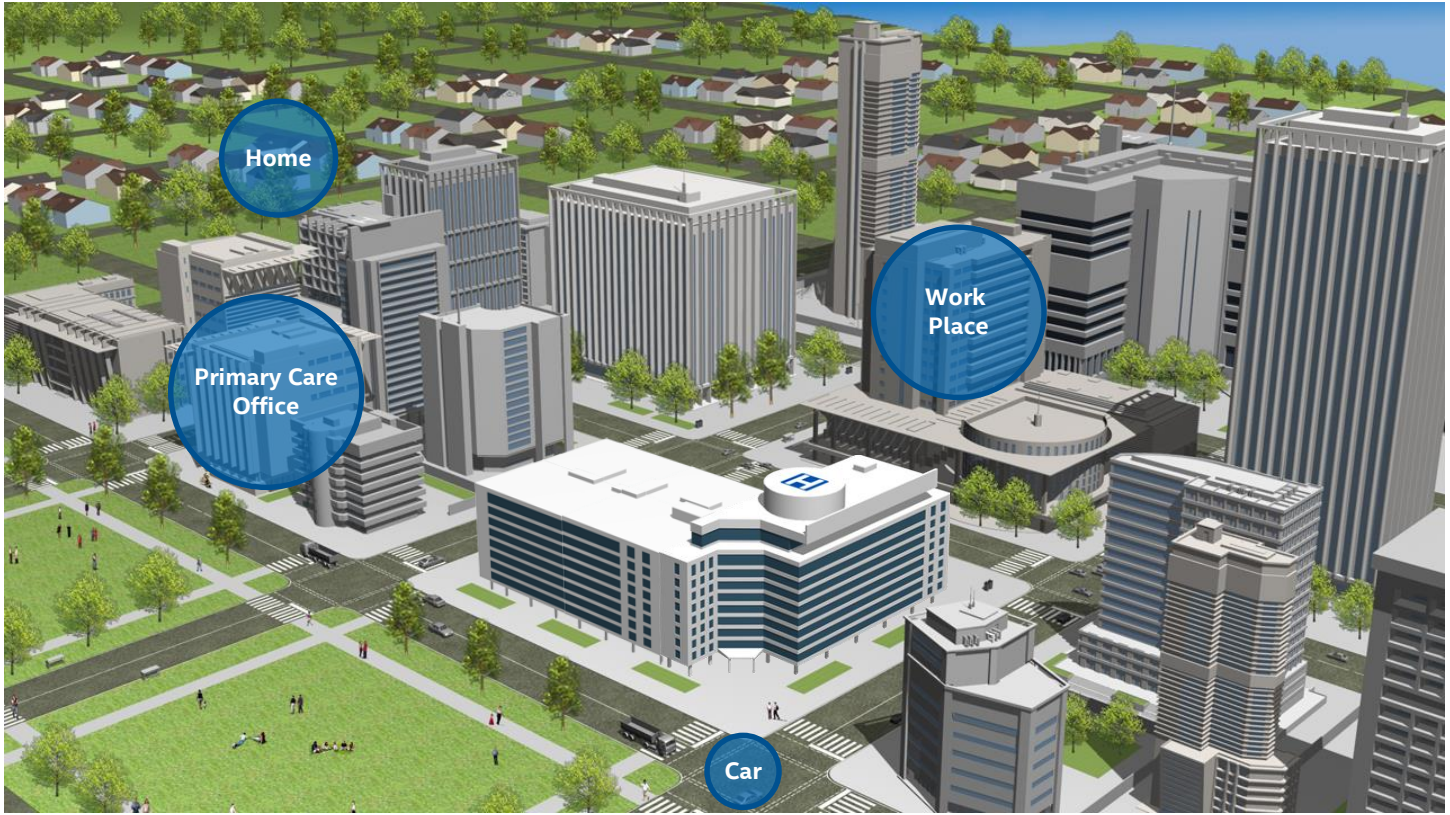


Sources: 1. World Health Organization (WHO), http://www.who.int/whr/2006/media_centre/WHR06_slides_en.pdf; 2. http://www.health.gov.au/internet/ministers/publishing.nsf/Content/0331A64AC2F08266CA2574F8000D8555/$File/nr147.pdf; 3. 2011 Chinese Health Statistics Digest, Ministry of Health, PRC, page 105; 4. http://www.euro.who.int/__data/assets/pdf_file/0017/78520/E96812.pdf; 5. http://new.paho.org/hq/dmdocuments/2009/OD-328-SO13-16-e.pdf; 6. Michael J. Dill and Edward S. Salsberg, "The Complexities of Physician Supply and Demand: Projections Through 2025," Association of American Medical Colleges, Center for Workforce Studies, November 2008, https://members.aamc.org/eweb/upload/The%20Complexities%20of%20Physician%20Supply.pdf;

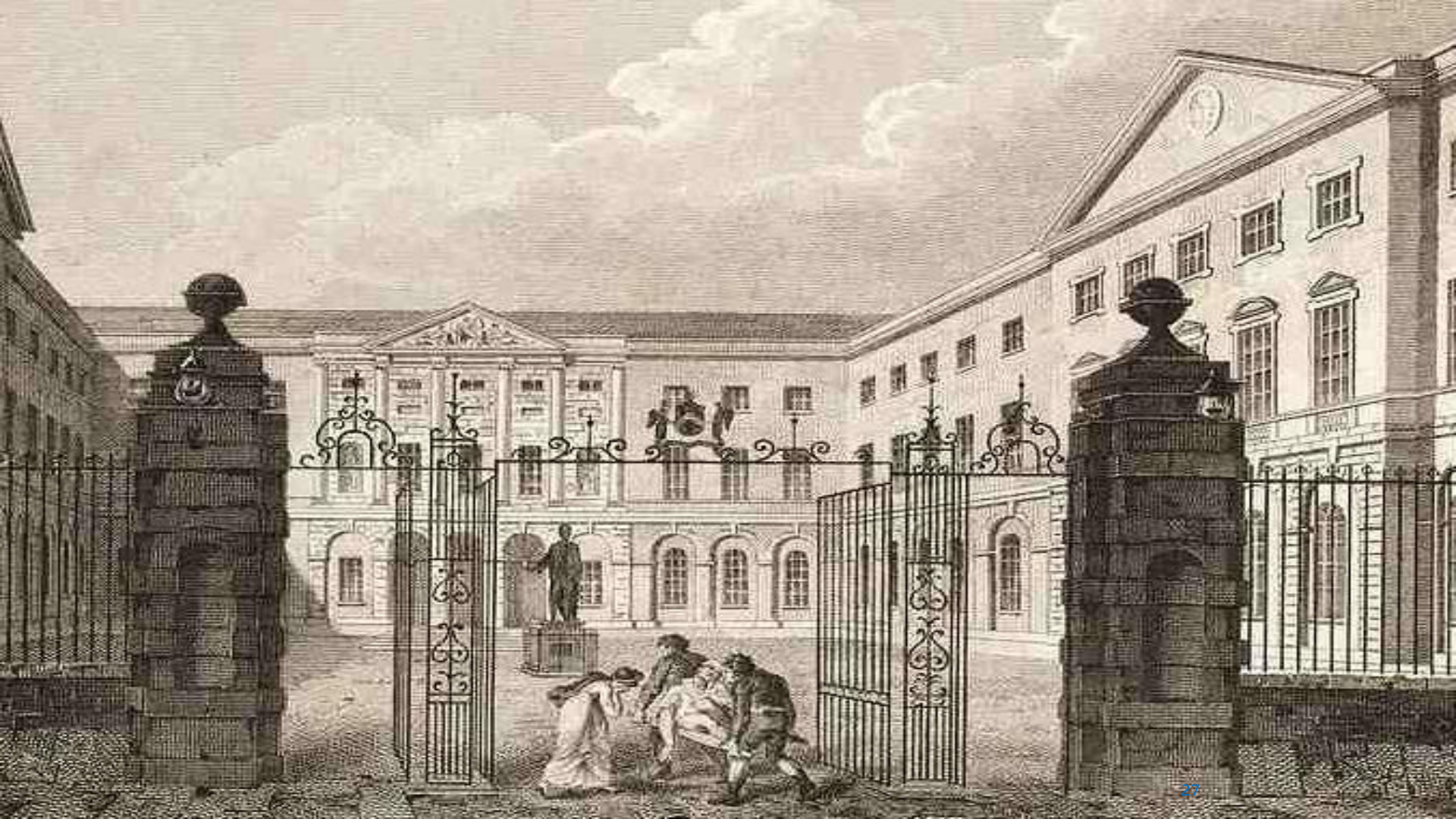
Intel Strategy for Innovation: Place-shift, Skill-shift, Time-Shift from Mainframe to Personal Health

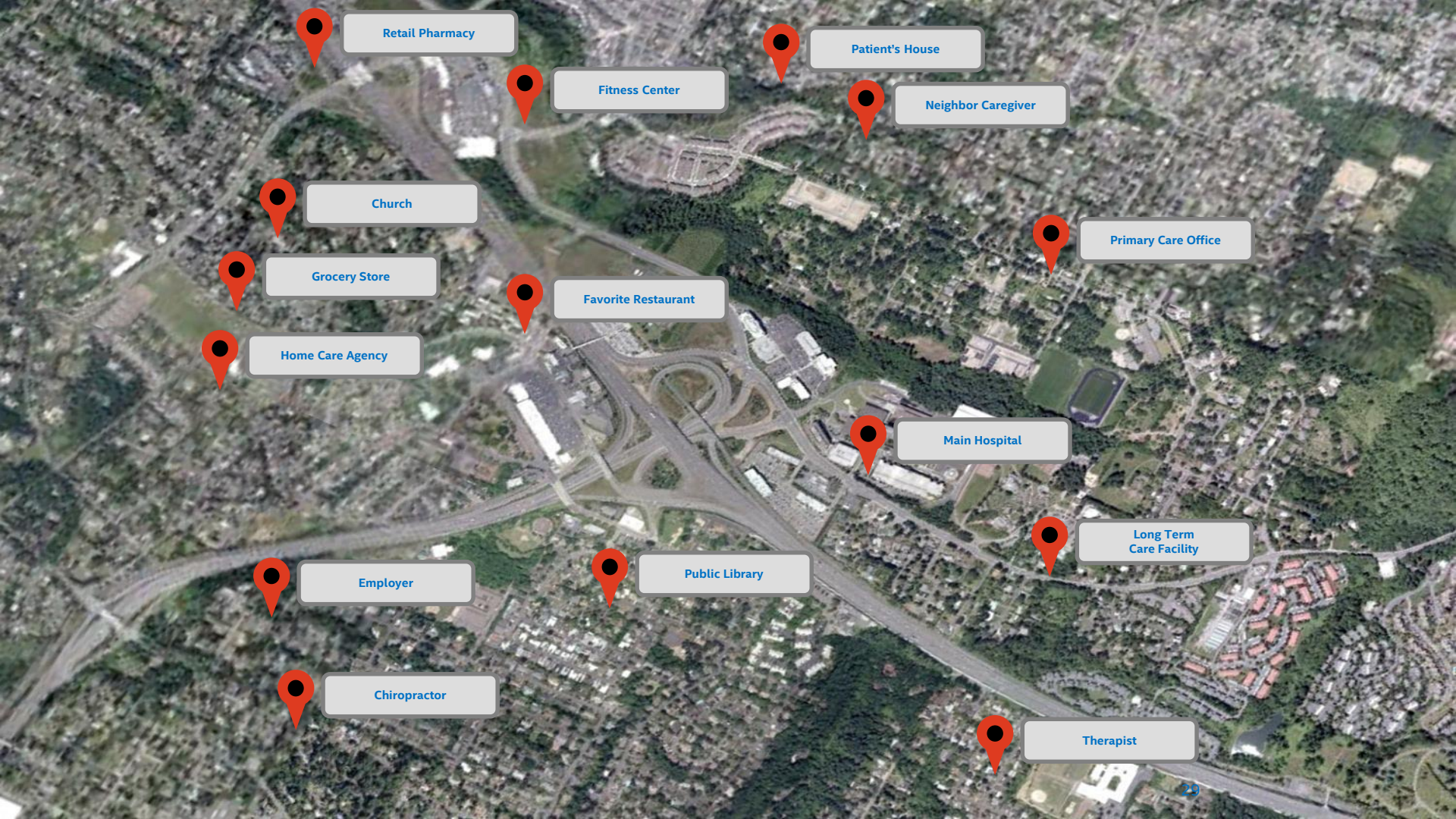


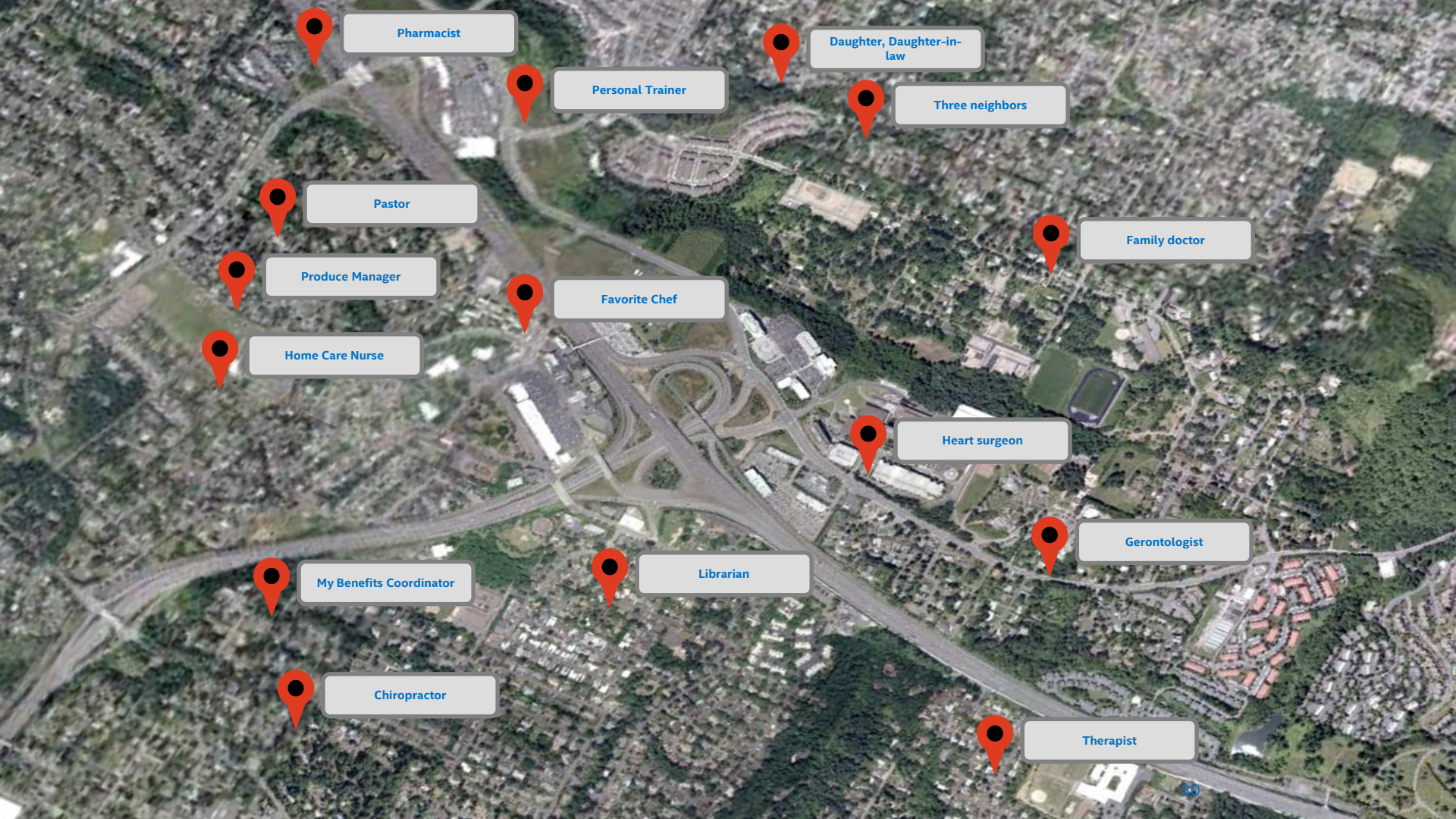
Distributed: from mainframe campus to community care

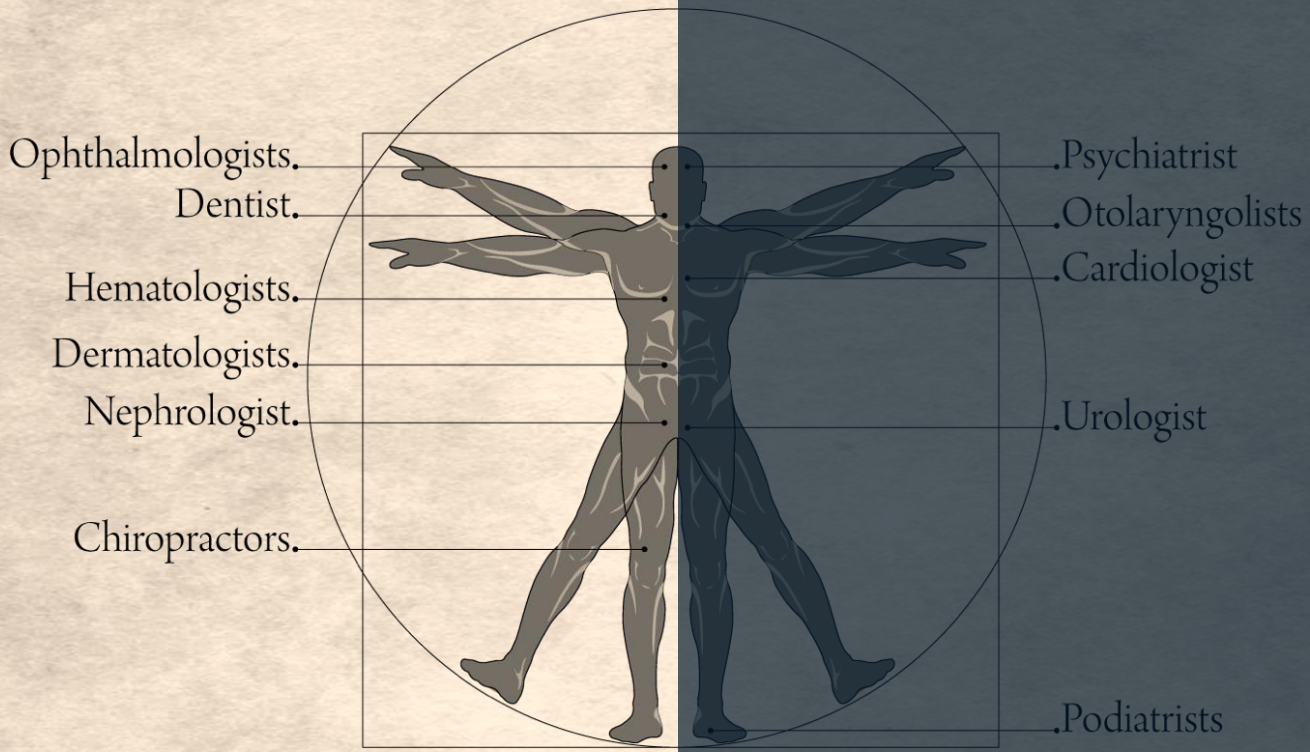


Need smaller mainframes, distribute capacity to home, workplace, etc.

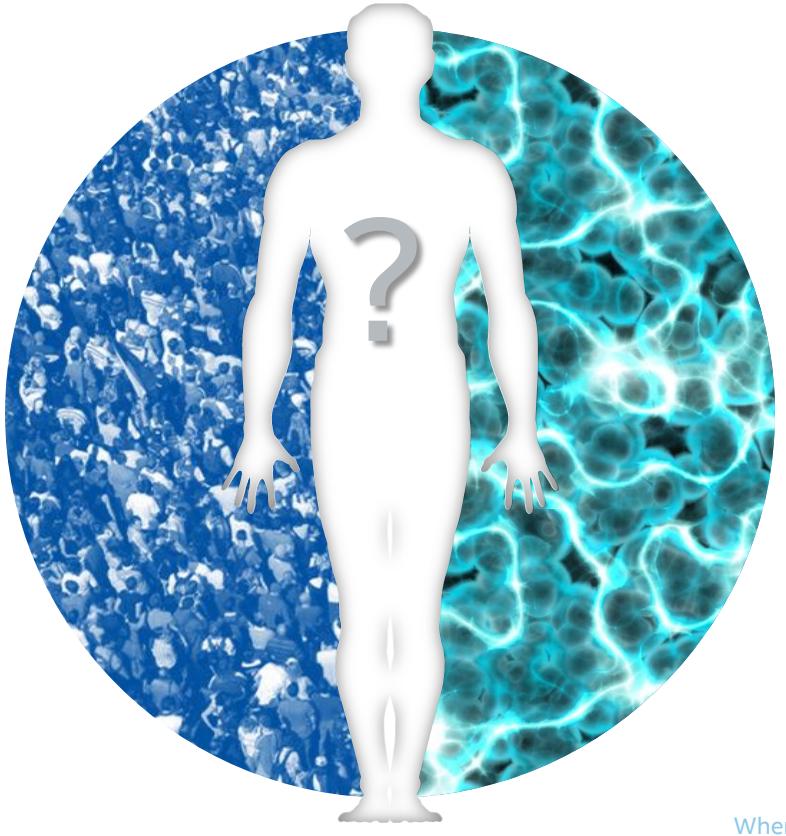



Retail Pharmacy
Patient's House
Fitness Center
Neighbor Caregiver
Church
Primary Care Office
Grocery Store
Favorite Restaurant
Home Care Agency
Main Hospital
Long Term
Care Facility
Public Library
Employer
Chiropractor
Therapist

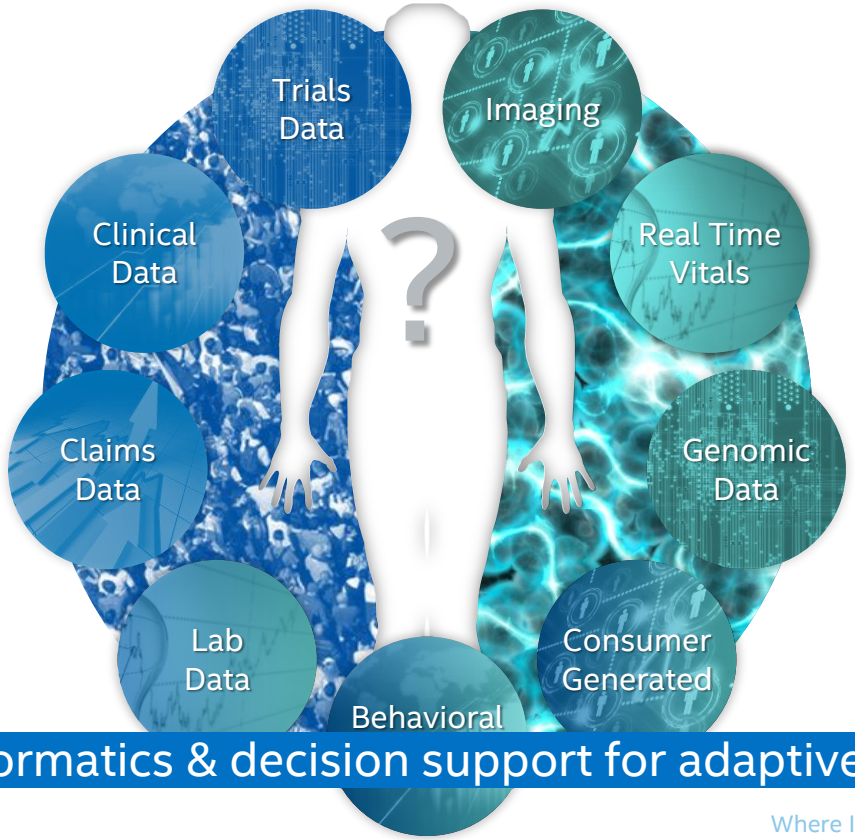

Pharmacist
Daughter, Daughter-in-law
Personal Trainer
Three neighbors
Pastor
Family doctor
Produce Manager
Favorite Chef
Home Care Nurse
Heart surgeon
Gerontologist
My Benefits Coordinator
Librarian
Chiropractor
Therapist


Ophthalmologists.
Dentist.
Hematologists.
Dermatologists.
Nephrologist.
Chiropractors.
Psychiatrist
Otolaryngolists
Cardiologist
Urologist
Podiatrists

Personalized: from population to person



Personalized: from population to person



Need next gen informatics & decision support for adaptive, n=1 medicine

Vision of Personal Health, 15 years ago

Pillars of a Personal Health paradigm…

Care Networking

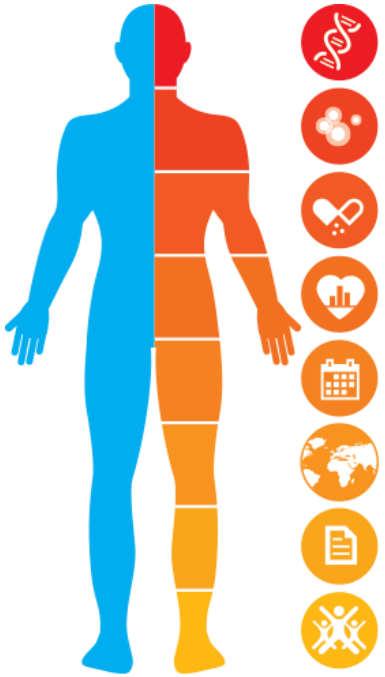
shift from institutions to mobile, home-based, & community care.

Care Anywhere

shift from solo to team-based care across orgs & IT systems

Care Customization

shift from population-based to person-based treatment



Care Networking

Culture and capability transformations

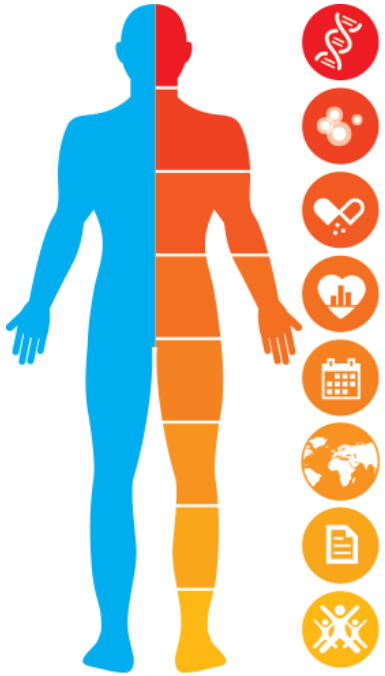
- Skill-shift to patients/family via web
- Shift to self-service, online time-banking tools
- Shift from transaction to care coordination SW tools
- Shift clinical decision support from individual practitioner tools to group tools
- Shift to population/patient risk stratification
- Shift quality analytics from batch reports to near real-time feedback loops

Care Anywhere

Culture and capability transformations

- Place-shift care via telehealth
- Shift remote patient monitoring to everyday devices (phones, tablets, etc.)
- Shift from visit-based data capture to on-the-body (and *in*-the-body)
- Shift to self-care training & coaching agents
- Shift to DIY ‘comsumerized’ medical devices
- Shift to trusted mobility for on-the-go clinicians

Care Customization



Cultural and capabilities

- Shift to customized care to body, behaviors, biology
- Shift to genomics, proteomic data for individuals
- Shift to incorporation of patient goals in care plan
- Shift to predictive, preventive modeling of individuals
- Shift to precision therapies, drug customization
- Shift to tissue generation & ‘designer organs’

Learning anew from “old” ideas & experiments…

Activities of Daily Living

Automated Behavioral Monitoring

"All who joy would win, must share it, - happiness was born a twin."

- Lord Byron

2:02

Tuesday, September 30, 2014

CareWheels: 12 years ago it was a technical challenge

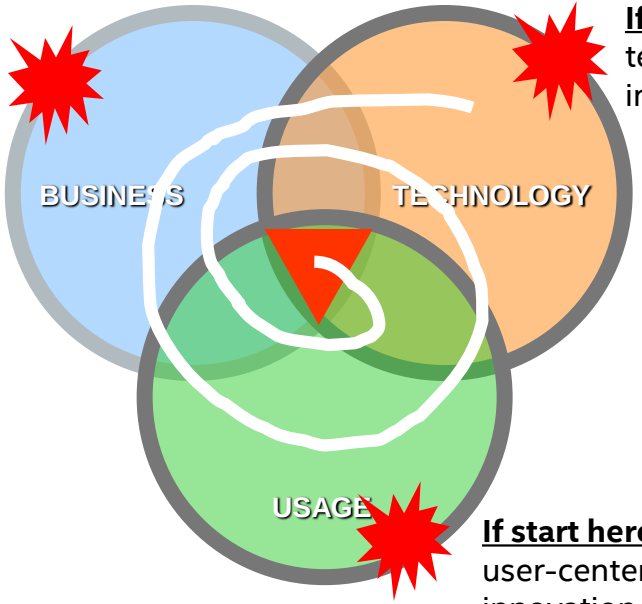
Now it is a care model & business model innovation challenge!

Why home care efforts have failed to scale, IMHO

1. “Home care” seen up front as “niche” or “exception,” not “default” or “normal” care model (mainframe thinking)
2. Pilots weren’t designed to scale or to test enough of the system to deliver sustainable value (myth of “piloting the technology”)
3. Neither the incentives nor the infrastructure were ready for prime time
4. Home-based care forces a level of patient/family-centeredness and holistic care that traditional systems are not ready for
5. And…no real process, approach, or rigor for iterative innovation in most healthcare institutions

Our approach to *system* innovation: can start anywhere

If start here:
market-driven
innovation



If start here:
tech-driven
innovation

If start here:
user-centered
innovation

BUT MUST EVENTUALLY COVER ALL THREE CIRCLES…WITH EXPERT TEAMS WHO WORK TOGETHER ON INNOVATING EACH PART, ITERATIVELY.

Care *system* innovation is complex, multi-disciplined

Business viewpoint (The Business Model)

Payment model

Ecosystem & dollar flows

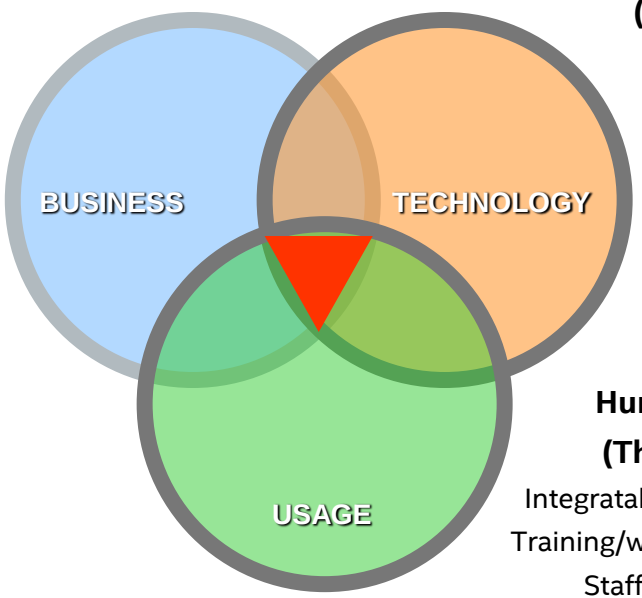
Governance, liability

Profitability/revenue

Patient retention

Competition from other models/clinics

Quality measurement



Technology viewpoint (The Technology Model)

IT strategy and plan

Cost effective

Community based

Care coordination

Across orgs, e.g. ACO

Human viewpoint (The Care Model)

Integratable into workflow

Training/workforce in place

Staff retention/health

Useful & usable systems

Desirable

Sustainable

Can we—will we—compete in *this* “space race”?

Will the U.S. have a national plan for personal health?

I worry about U.S. limited imagination & progress

"Them" examples	"Us" examples
How to make home/community care the default model of care over time	How to add bits of home care, telehealth to institution-centric model over time
Inventing new kinds of care workers, designing for care workforce flexibility	Licensure turf battles and protectionism, creating boundaries & barriers to flexibility
Building specific grids for consumer health & genomics, grid design for sustainable health	Creating regulatory/business uncertainty for new tech, no health/aging grid design
See aging innovation as a source of new IP, jobs, and GDP growth	See aging as a drag on the economy and a burden to address
National plans to address aging issues, across government & private stakeholders	No national plans on aging, no place to stand to address cross-agency needs
Health reform & innovation as an exciting future for citizens	Health reform & innovation as partisan war and source of disgust for citizens

Design principles we aim for in our work…

"Place shift" care to the home or least restrictive, preferred community setting whenever possible

"Skill shift" care to patients, caregivers, volunteers, and new workforce who are trained, evaluated, & incentivized

"Time shift" care from reactive to proactive, with a firm foundation of primary & preventive care

"Pay shift" to team-based outcomes, with holistic, balanced, and patient-centric measures of quality

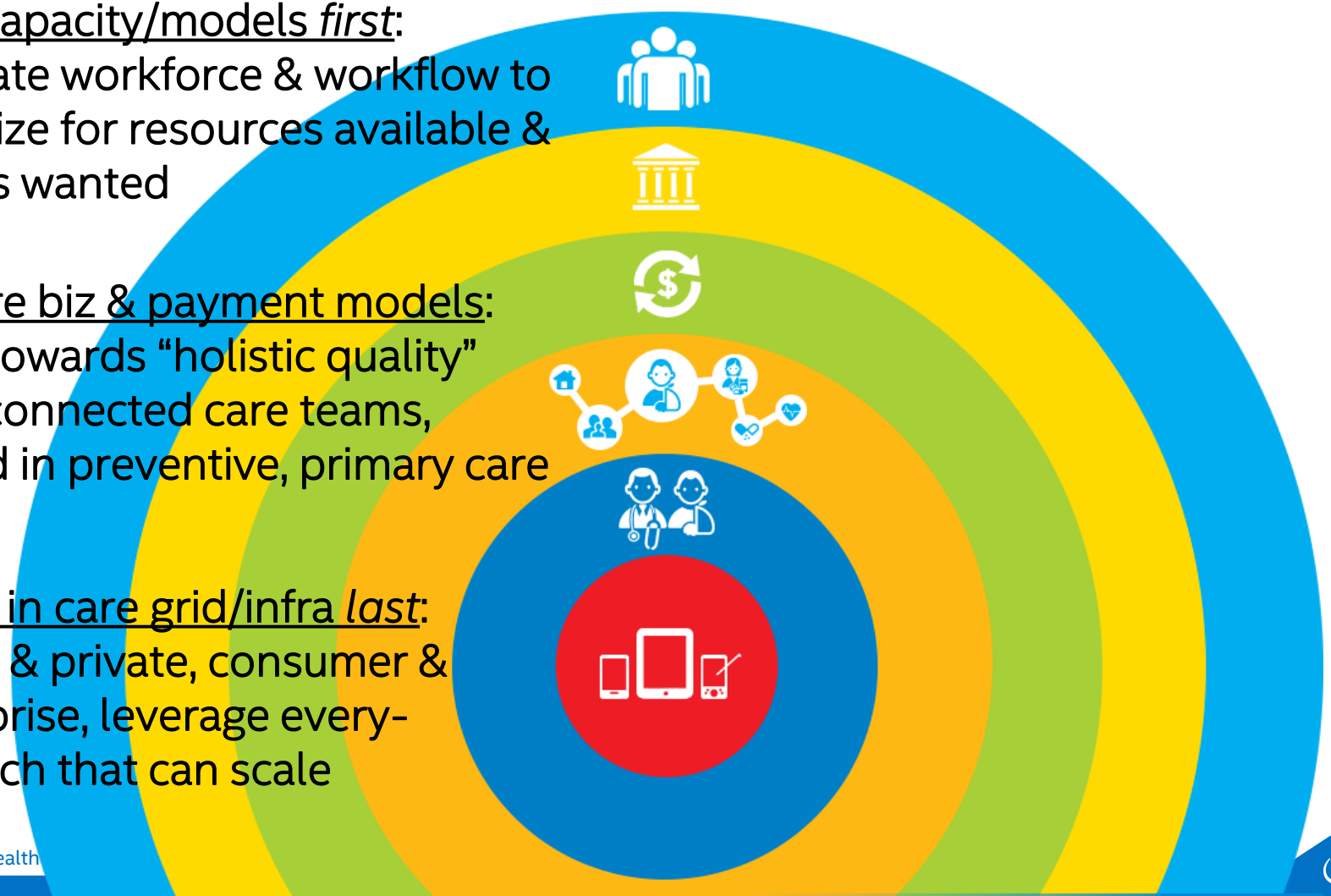
"Tech shift" from specialized to everyday technologies on an interoperable, public-private "grid" designed for health

MOVING FROM A MAINFRAME TO PERSONAL HEALTH PARADIGM IS NOT A LUXURY, BUT A DEMOGRAPHIC & ECONOMIC NECESSITY.

Care capacity/models *first*:
innovate workforce & workflow to optimize for resources available & results wanted

Explore biz & payment models:
drive towards "holistic quality" from connected care teams, rooted in preventive, primary care

Invest in care grid/infra *last*:
public & private, consumer & enterprise, leverage every-day tech that can scale



What could IOM/this community do to help?

A galvanizing report? “Crossing the chasm to the home & community”

Invent new quality metrics? “Was care delivered in the safest, preferred place for the patient?”

Create a compelling vision for stakeholders? “What will this mean to my livelihood, my life?”

An audacious national goal & roadmap? “50% of care to community by 2025?”

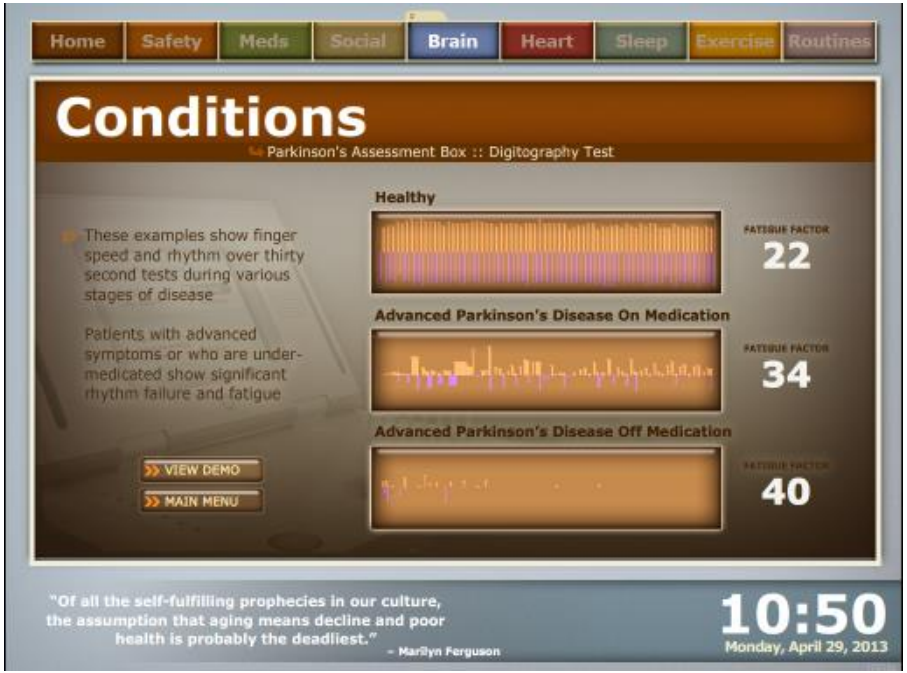
Thank you...

Discussion…

Care Anywhere: RPM on the Guide at Providence

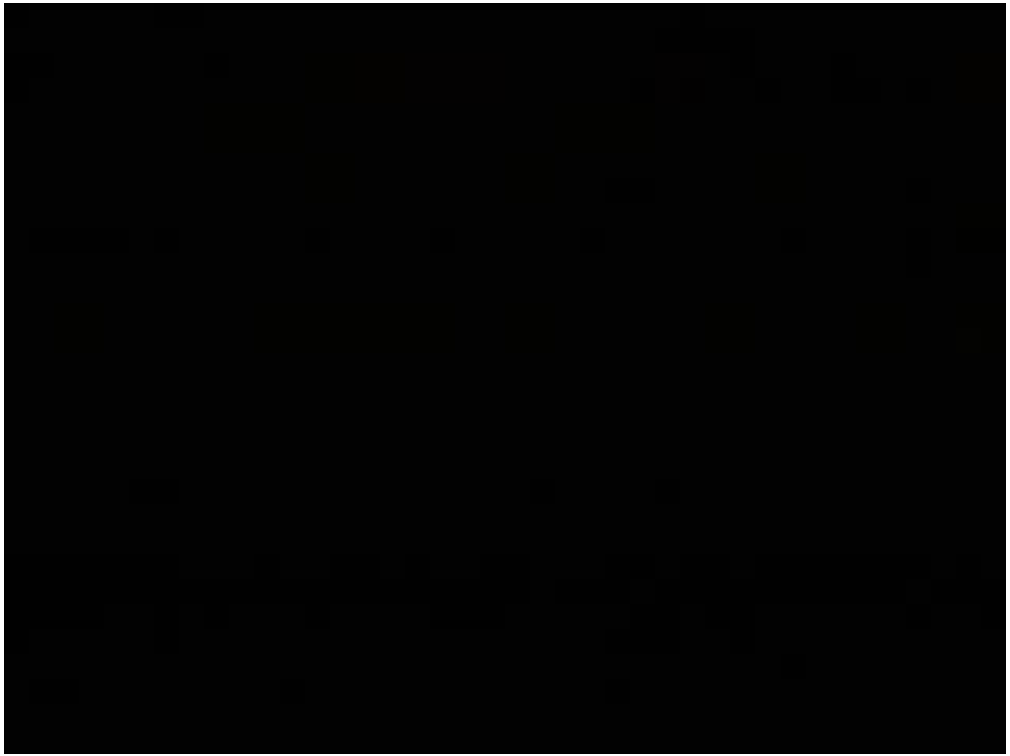
Focused 1st on simple vitals & care planning for Chronic Disease Mgmt.

Care Anywhere: Parkinson's Example



Can we make the huge, expensive tests for Parkinson's into a home device?

Care Networking: Skillshifting through Carewheels



Couldn’t scale biz at the time, but good ideas never die; they marinate!

Care Anywhere: Social Health Example

How do we help Alzheimer's patients maintain their informal care networks?

Care Customization: HPC for Genomics Companies

Current work in removing bottlenecks to personalized med/analytics

Care Customization: CAMP example

Can we target meds prompts to individual preferences, routines, literacy?