Toward Personal Health
Going Home and Beyond

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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
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.
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**
   - Housekeeping/food & grocery delivery/
     repairing/laundry

2. **Health Management & Medical Services**
   - EHR for seniors/chronic disease management/in
     home medical service

3. **Social Engagement Platform**
   - Synchronous/asynchronous communications/
     online-offline integration

4. **Services for Safe & Secure Living**
   - Benefit distribution/environment monitor &
     emergency service/anti-lost

Holistic & Simple experience
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...

% of population over age 60

- 30+ %
- 25-29%
- 20-24%
- 10-19%
- 0-9%

WW Average Age 60+: 10%

Global Aging: the other inconvenient truth...

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The (crossover) point of no return...

Growth of 100 Year Olds from 2009-2050

- 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

- **United States**
  - 2010: $2,394Bn
  - 2011: $2,555Bn
  - 2012: $2,726Bn
  - 2013: $2,905Bn
  - 2014: $3,098Bn
  - 2015: $3,305Bn

- **Rest of World**
  - 2010: $667Bn
  - 2011: $707Bn
  - 2012: $755Bn
  - 2013: $813Bn
  - 2014: $883Bn
  - 2015: $966Bn

- **Western Europe**
  - 2010: $1,654Bn
  - 2011: $1,713Bn
  - 2012: $1,783Bn
  - 2013: $1,867Bn
  - 2014: $1,964Bn
  - 2015: $2,075Bn

- **Asia-Pacific**
  - 2010: $999Bn
  - 2011: $1,081Bn
  - 2012: $1,179Bn
  - 2013: $1,296Bn
  - 2014: $1,438Bn
  - 2015: $1,608Bn
Health Worker Shortage

Shortage of 124,000 physicians by year 2025⁶

Loss of healthcare workers due to migration to developed countries⁵

57 countries, mostly in Africa, have critical shortages

Reliance on foreign nationals to address shortages⁴

Less than 1 nurse per 1000 people in rural China³

Shortage of 4.3 million health worker globally¹

Gov’t estimates 6 in 10 Australians affected by GP shortage²

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.
Where Information and Care Meet

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

- Lord Byron

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

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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

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