information ecosystems for well-being: new tools, new connections, new identities

Information creates the flows in our ecosystems of well-being. It connects medical practice, public health, and the private rituals of daily life in a thickly layered environment of personal choice and constraints. Out of these flows, we form the narratives that resolve medical mysteries, inspire healthy behaviors, and even give meaning to our lives.

But information flows can also overwhelm. They can flood our ecosystems with noise that undermines our well-being. And over the next decade, new technologies, proffered by new players, will open the flood gates. Biosensors, swarms of drones, Internet-connected appliances, and even retail transactions will generate unprecedented flows of data. By 2022, the volume of digital information will scale so rapidly that we may lose the flow. The important stories embedded in our fragmented data may barely inform the reality of our lives.

In freshly disturbed biological ecosystems, pioneer species create nutrients for other organisms. In information ecosystems for well-being, innovators are like these ecological pioneers. They make data and information more usable as resources to support well-being. They create pathways that reconnect the flows, who reshape the powerful streams of data into actionable resources for health and well-being. They will also automate, amplify, and provide high-resolution views of who we are and what it means to be healthy and happy.
**VALUING FUTURE HEALTH**

Automated/predictive systems are essential in healthcare, particularly in managing the complexities of modern medical environments, ensuring that well-being is prioritized. This approach leverages data and analytics to inform decision-making processes, improving patient outcomes and healthcare systems' efficiency.

**DISTRIBUTED HEALTH POLICING**

A distributed health policy framework can significantly improve public health outcomes. By integrating automated systems and predictive analytics, policymakers can anticipate and mitigate public health threats, ensuring a safer and more resilient society.

**Aware and Responsive Systems**

Sustainable solutions for public health systems require a holistic approach that integrates technology and policy. Effective strategies include enhancing surveillance capabilities, improving data management, and fostering collaboration among stakeholders to address emerging challenges.

**SMART PHONES AND DISEASE TRACKING**

Innovative technologies can transform healthcare by enabling real-time monitoring and intervention. Devices that track health indicators can help prevent the spread of infectious diseases and provide early warning signals for public health officials.

**PROGRAMMABLE SELF-CARE**

Preventive care technologies can empower individuals to manage their health proactively. Advancements in wearable tech and mobile applications offer personalized health and wellness solutions.

**MICROWAVE FOR WELL-BEING**

A technology that could significantly improve health outcomes is microwave technology. Its potential applications range from providing affordable nutrition solutions to enhancing digital health and telemedicine services.

**QUANTIFIED STORYTELLING**

Artistic and narrative approaches can be highly effective in communicating health messages. By leveraging storytelling techniques, healthcare providers can make complex health topics more relatable and engaging, thereby increasing public awareness and engagement in health-related issues.

**TIME-DIRECTED INTERVENTIONS**

Designing optimized nutrition and health interventions is crucial in achieving optimal well-being. Tailored interventions that consider individual needs and societal trends can lead to sustainable health improvements.

**AFFECTIVE HEALTH SENSING**

Technology is being applied to monitor and manage mental health conditions effectively. Wearable devices and AI-driven analytics can provide timely interventions to support mental health.

**TRACKING MULTISPECIES CONTEXTS**

Adapting to climate change and environmental stressors requires a comprehensive approach. Multispecies perspectives can provide insights into the complex interactions among species and the environment, guiding effective conservation strategies.

**OPTIMIZING MICROBIAL DIVERSITY**

The role of the microbiome in health and disease is becoming increasingly recognized. Research is uncovering new strategies for optimizing microbial diversity, particularly in the context of environmental stressors, to support human health and well-being.

**PERSUASIVE PROFILES**

In a digital age, persuasiveness and influence play a significant role in behavior change. By leveraging persuasive design principles, technology can be used to influence public health behaviors, such as adopting healthier lifestyles and behaviors.
information ecosystems for well-being

DISTRIBUTED HEALTH POLICING
Automating surveillance for participatory public health

PERSUASIVE PROFILES
Personalizing behavior change

Persuasive content is tailored to each user's profile, such as

- Health information transparency
- Treatment adherence
- Lifestyle changes

DIVERSE HEALTH INFORMATION SYSTEMS
Engineering dynamic clinical information systems

- Data-driven prediction
- Personalized medicine
- Predictive analytics

high-resolution views and interventions
what we are

- Personalized medicine
- Predictive analytics
- Wearable technology

amplified roles and interactions
what we do

- Personalized medicine
- Predictive analytics
- Wearable technology

microwork for well-being
Distributing lightweight health and medical tasks to a flexible workforce

- Microtasks
- Remote work
- Crowd-sourcing

QUANTIFIED SELF-CARE
Prescribing therapeutic information streams

- Data-driven prediction
- Personalized medicine
- Predictive analytics

PROGRAMMABLE SELF-CARE
Artfully communicating health data to lend relevance

- Data-driven prediction
- Personalized medicine
- Predictive analytics

technological enablers

- Data-driven prediction
- Personalized medicine
- Predictive analytics

settings of everyday life

- Home
- Work
- Clinical
- Retail
- On-the-go

abundance of data and analytics

- Data-driven prediction
- Personalized medicine
- Predictive analytics

embraced environmental sensing

- Environmental health concerns
- Declining fossil fuel use
- Sustainability

proliferation of apps and services

- Apps
- Social media
- Wearable technology

rise of the internet of things

- Internet of things
- Machine learning
- Big data

emergence of intuitive experiences

- Intuitive interfaces
- Machine learning
- Big data

valuing future health

- Future of health
- Sustainability
- Environmental health

future of the ecosystems

- Ecosystems in flux
- Sustainability
- Environmental health

forecasts

- Forecasts
- Predictive analytics
- Data-driven prediction

signals

- Signals
- Predictive analytics
- Data-driven prediction

amplified roles and interactions
what we do

- Data-driven prediction
- Personalized medicine
- Predictive analytics

high-resolution views and interventions
what we are

- Data-driven prediction
- Personalized medicine
- Predictive analytics

automated and predictive systems
what we make

- Data-driven prediction
- Personalized medicine
- Predictive analytics
new opportunities to support well-being in the many settings of everyday life

<table>
<thead>
<tr>
<th>hotspots</th>
<th>settings</th>
<th>work</th>
<th>clinical</th>
<th>retail</th>
<th>on-the-go</th>
</tr>
</thead>
<tbody>
<tr>
<td>automated and predictive systems</td>
<td>home</td>
<td>Create dynamic communications to reach the diverse and coexisting preferences of different people living in the same home</td>
<td>Use sensing technology to understand and anticipate employees’ true physical and emotional health states, but be mindful of the potential to violate privacy and create an oppressive atmosphere</td>
<td>Develop capabilities in pattern mining to anticipate community health needs and partner with community efforts to build networked prevention and intervention strategies</td>
<td>Build responsive communication channels and interoperable systems between retail medicine and clinical medicine to reduce the information work for the consumer</td>
</tr>
<tr>
<td>amplified roles and interactions</td>
<td>work</td>
<td>Sponsor platforms and allocate time for employees to engage in micro-contributions to support each other’s well-being, such as donations of paid time off, vacation, and care</td>
<td>Invest in clinical data systems that use lightweight technology and can easily be upgraded and adapted to multiple operating systems, devices, and user experiences.</td>
<td>Remake the shopping experience into a learning experience by deploying health coaches in physical and virtual retail settings to help customers individually tailor well-being and diet regimens</td>
<td>Create participatory platforms to allow people to use the personal, community, and environmental data they capture for public health in transparent and respectful ways</td>
</tr>
<tr>
<td>high-resolution views and interventions</td>
<td>retail</td>
<td>Connect high-resolution understanding of the body and the larger environment to change the way people design health into their homes and communities</td>
<td>Be sensitive to individuals’ biological rhythms and the needs that accompany them, particularly those whose well-being and health depend on time-targeted therapies</td>
<td>Use new evidence of the harmful effects caused by changes to the microbial environment and multispecies eco-system to anticipate new supply chain and facilities management challenges</td>
<td>Prepare for higher scrutiny as citizens gain a deeper understanding of the health effects of waste management and sourcing practices and increasingly gain the ability to monitor them</td>
</tr>
</tbody>
</table>

Across the basic settings of everyday life, from home and work to clinics and shops and everywhere in between, new information ecosystems will create opportunities to support well-being in new ways—making new information flows truly actionable.

To further explore how people will use information to create well-being in the settings of everyday life, look for Health Horizons’ Information Ecosystems of Well-being tool kit this fall. It will describe personas of leading edge health pioneers, the emerging strategies they will use to make information actionable, and the changing settings of everyday life they will navigate. Together with this map, it provides a set of tools for thinking systematically about how to use abundant data to enhance health and well-being.
a guide to the future
information ecosystems for well-being

This map is a guide to our rapidly changing information ecosystems for well-being. You can use it to explore the three hotspots of innovation and well-being and the opportunities for new products, services, policies, and strategies in a variety of settings for the pursuit of health and well-being. Within each hotspot are forecasts that identify innovations and disruptions that will make health information actionable.

Innovation hotspots

automated and predictive systems Data mining and analytics will fuel efforts to create information systems that can anticipate problems for health and healthcare—and intervene automatically.

amplified roles and interactions Abundant data and the new interventions it brings will change the way people connect with ideas, information, organizations, and with one another, amplifying the power of information to create new meanings of well-being.

high-resolution views and interventions The ability to see patterns and phenomena at new scales from the smallest to the greatest will change the way we thrive as complex living organisms.

Forecasts and signals

This map contains 12 forecasts of innovations and disruptions that respond to the challenge of making information actionable for well-being. Each forecast is accompanied by one or two signals. These are examples from today’s world that point to the future depicted in the forecast.

The opportunities for novel solutions

The innovation hotspots will also create big opportunities for pioneers across our economies and communities. Jump-start your own future by anticipating these opportunities in the many settings where we will create well-being in new ways over the next decade, from clinical and retail settings to work and home and even on the go.

ABOUT IFTF | We are an independent, nonprofit strategic research group with more than 40 years of forecasting experience. We offer clients a deep understanding of the identifying trends and discontinuities that will reshape well-being and health in the next ten years.

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