

Healthy Environments through Architecture: *Wrestling with Capacity*

UIA – IFHP UTC5

Ray Pentecost, DrPH, FAIA, FACHA, LEED AP

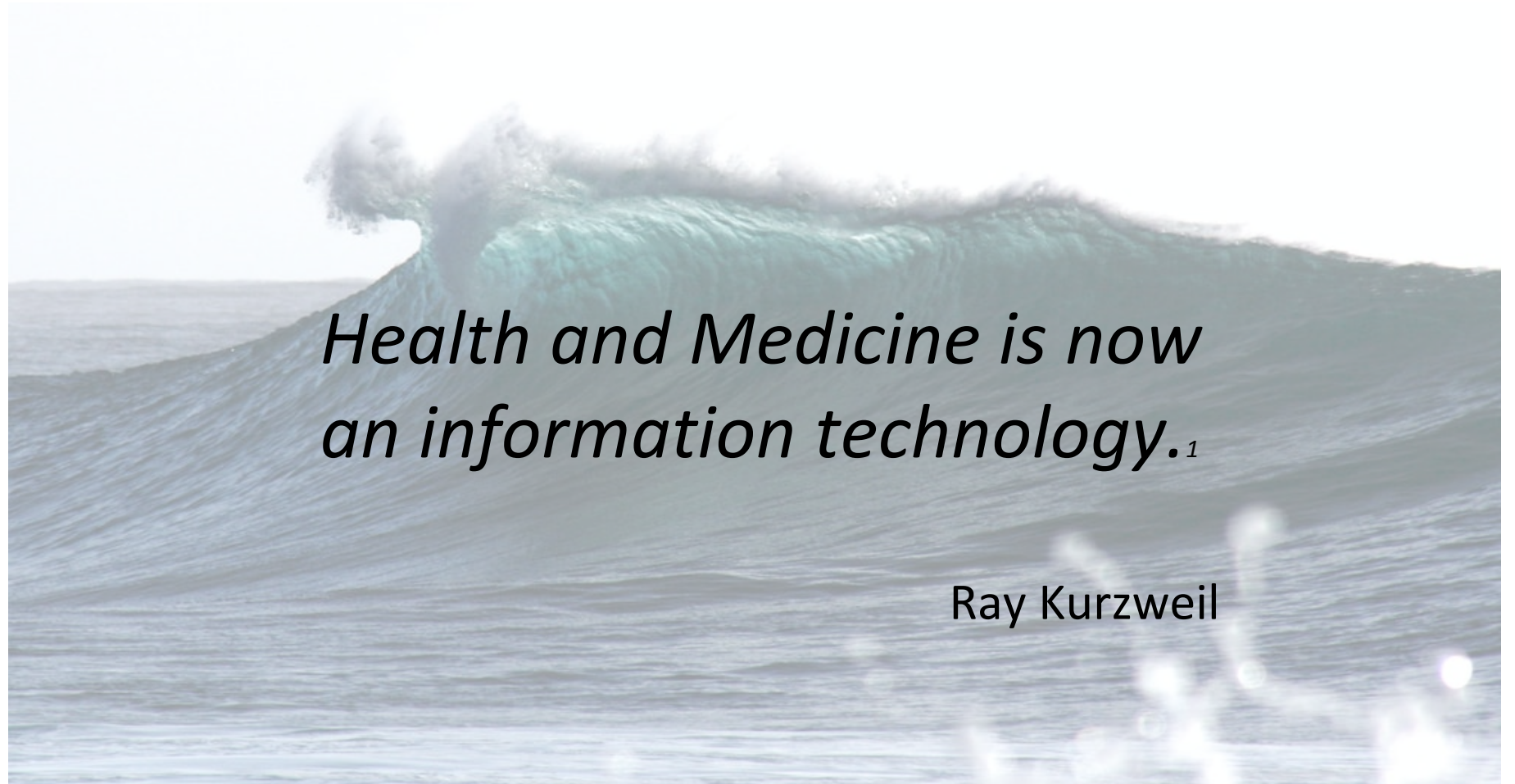
Ronald L. Skaggs and Joseph G. Sprague Chair of Health Facilities Design
Director, Center for Health Systems & Design, Texas A&M University

2020-2023 Director, UIA – Public Health Group



Design for Health

Poised



*Health and Medicine is now
an information technology.¹*

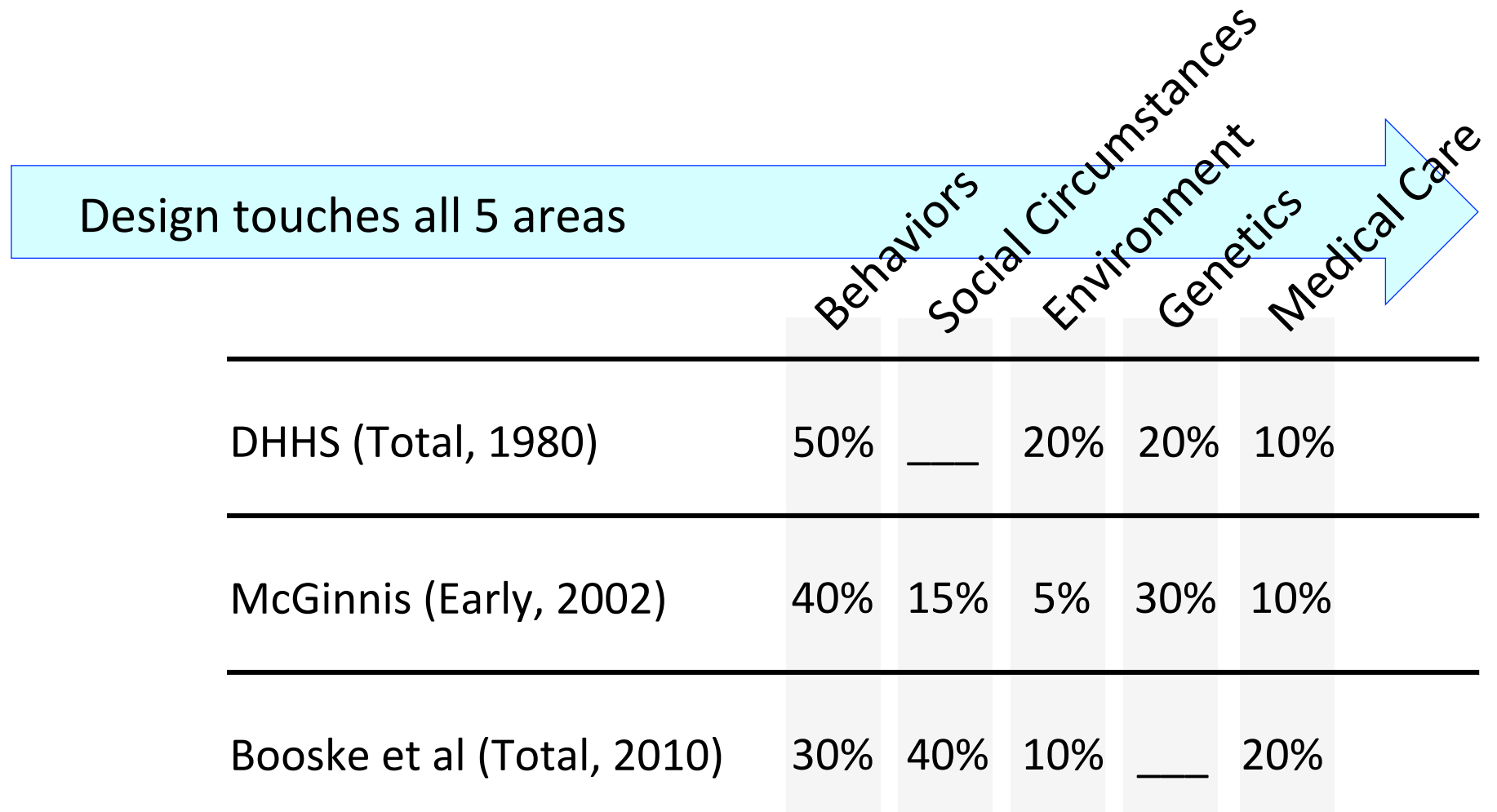
Ray Kurzweil

<https://unsplash.com/s/photos/breaking-wave>

¹ Evans, Arwen, <http://blog.inventivhealth-pr.com/global-healthcare/ray-kurzweils-future-of-health-and-medicine/>, March 13, 2012.

Design for Health Determinants

Influences



McGovern, L. et al, Health Policy Brief: The Relative Contribution of Multiple Determinants to Health Outcomes, *Health Affairs*, August 21, 2014.

Design for Health Stages

Data

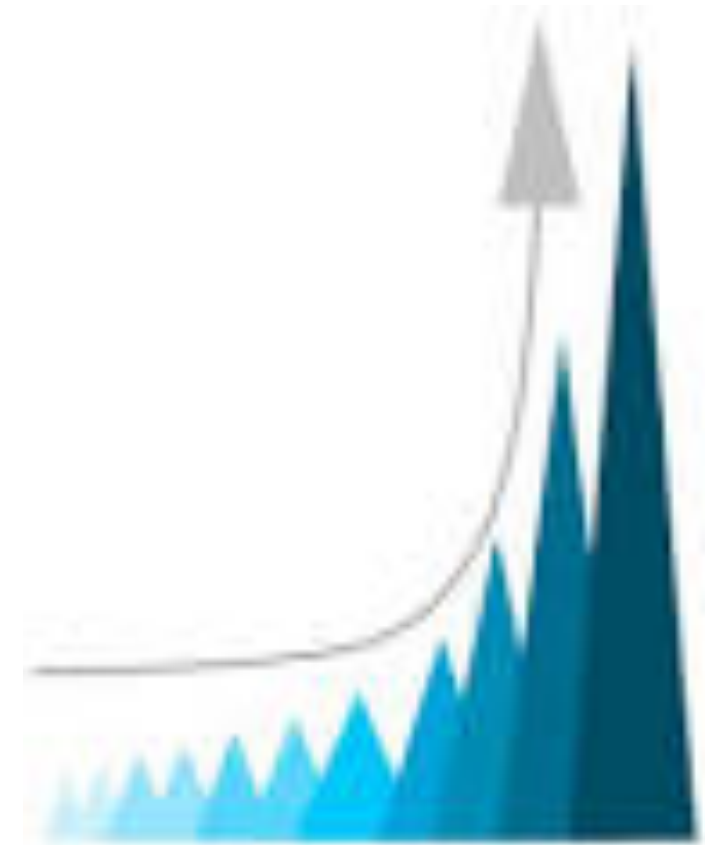
Proliferation

New sources
Continuous
Overwhelming

Design for Health

Tipping Point

By 2020:
Medical
knowledge
will start
DOUBLING
every **73 days!**¹

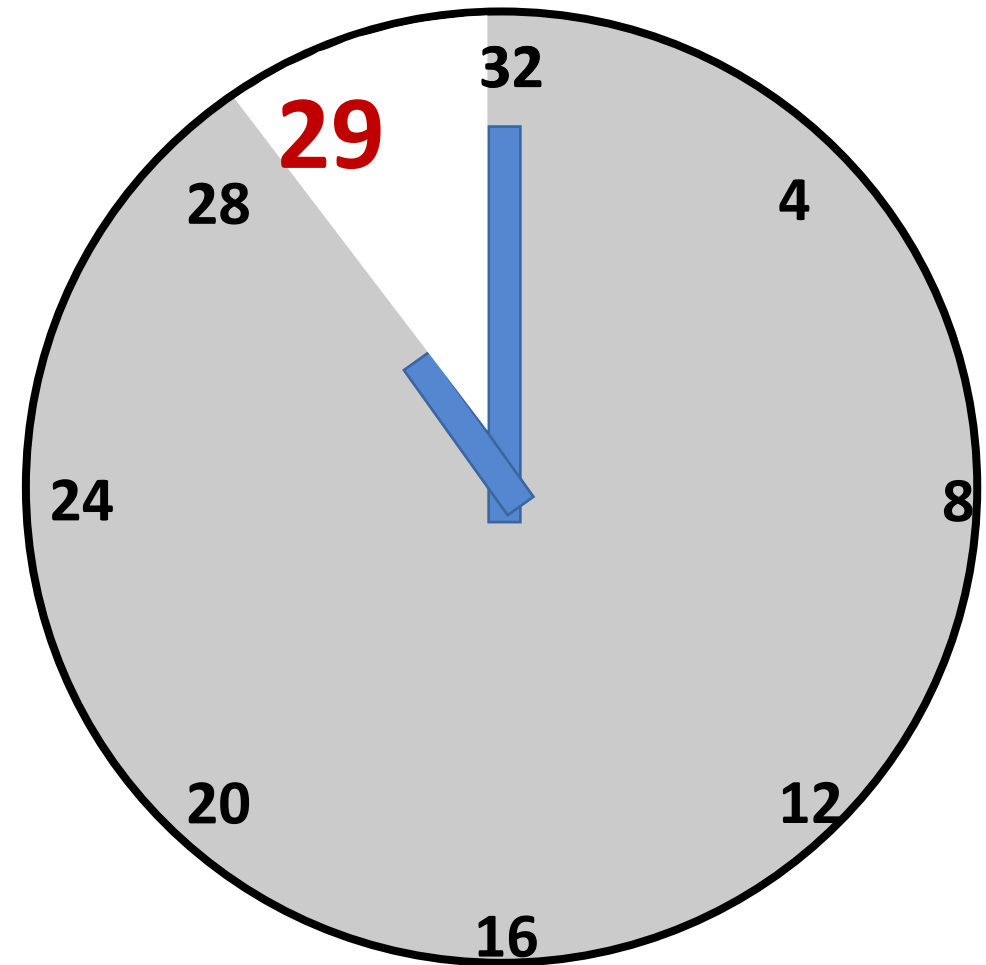


1 20/20 Vision: Curriculum Renewal Project, University of Iowa healthcare, 2012.

Design for Health

*Tipping
Point*

Physician
Currency



McConaghie, Andrew, IBM Watson: a holistic approach, Deep Dive Magazine, PharmaPhorum, November 2016.

Design for Health

Tipping Point

By 2025:

The
Trillion Sensor
economy₂

Internet of
Everything

100 billion
connected
devices

Dozen+ sensors
EACH

2 Singularity Hub, May 19, 2015

Design for Health

*Tipping
Point*

Patients

300 million books

personal data EACH individual¹



2

¹ Watson Health, Watson Health: Get the Facts, Blog Post, www.ibm.com/blogs/watson0health/watson-health-get-the-facts/

² <https://www.freeimages.com/search/books-on-shelf>

Design for Health

Tipping Point

Ray Kurzweil: *By the 2030s we will connect our neocortex, the part of our brain where we do our thinking, to the cloud.*

First graders today...

New Medical School?

Ray Kurzweil predicts that the Singularity will take place by 2045, AI Business,
<https://aibusiness.com/ray-kurzweil-predicts-that-the-singularity-will-take-place-by-2045/>, March 17, 2017

Design for Health Stages

Data

Proliferation

New sources
Continuous
Overwhelming

Processing

New analytics
Integrated
Powerful

Design for Health

Capacity

Story: Building the next generation computer

1,000,000X

Goal: 1 million X faster than today's fastest

His friend has 10 years of social data...

Calculation: 1 million years using today's fastest

Design for Health Stages

Data

Proliferation

New sources
Continuous
Overwhelming

Processing

New analytics
Integrated
Powerful

Patterns

New insights
Limited utility
Overwhelming

Artificial
Intelligence

Design for Health

Capacity

Artificial intelligence strength:

Patterns and statistical probabilities.

Common weakness:

The WHAT without the HOW/ WHY

Design for Health Stages

Data

Proliferation

New sources
Continuous
Overwhelming

Processing

New analytics
Integrated
Powerful

Patterns

New insights
Limited utility
Overwhelming

Artificial
Intelligence

Precision

New value
Strong utility
Manageable

Augmented
Intelligence

Interdisciplinary
Design
Tool

Design for Health

Design Intelligence

Augmented intelligence:

Takes the 29 hour Watson “digest” and sorts it by what you need.¹

Importance
Relevance
Innovation

Connections will matter

1 R. Stanley Williams, Professor, Electrical & Computer Engineering, Hewlett Packard Enterprise Company Chair Professor

Design for Health

*Design
Intelligence*

UNC

1000 patients



Watson

***Watson** identified a treatment ...for **30%** of the patients!*

Ned Sharpless, MD, UNC Chappel Hill

Imagine such guidance on **Designing for Health!**

Rose, Charlie. (2016). *Report Title* (Artificial intelligence positioned be be a game-changer). CBS Interactive, 60 Minutes. New York, NY.

Design for Health

Poised...

to manage
challenge of
CAPACITY

Thank
You!



<https://unsplash.com/s/photos/breaking-wave>