

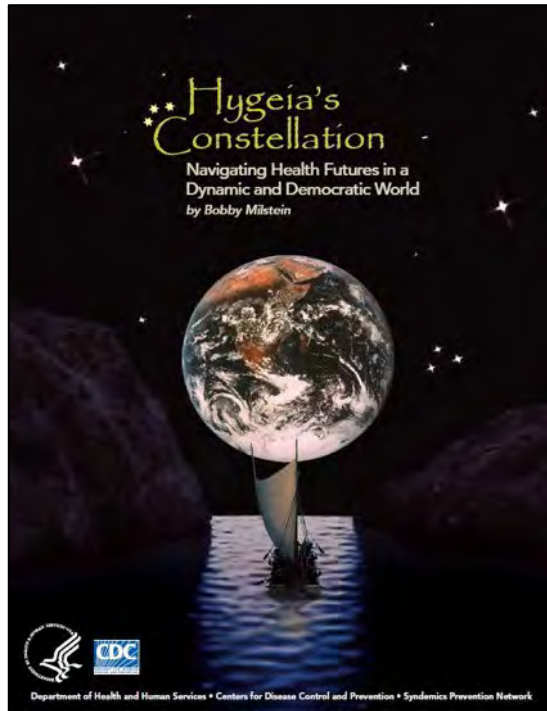


What Does It Take to Be Good Stewards of the Systems That Shape Our Lives Together?

An Insider's View from CDC and ReThink Health

System Dynamics Conference
Chicago, July 24, 2023

Bobby Milstein
ReThink Health, The Rippel Foundation
bmilstein@rippel.org



“Public health is probably the most successful system of science and technology combined, as well as social policy, that has ever been devised...It is, I think, a paradigmatic model for how you do *concerned, humane, directed science.*”

**-- Richard Rhodes
Pulitzer Prize Author, *The Making of the Atomic Bomb***

How is it directed?

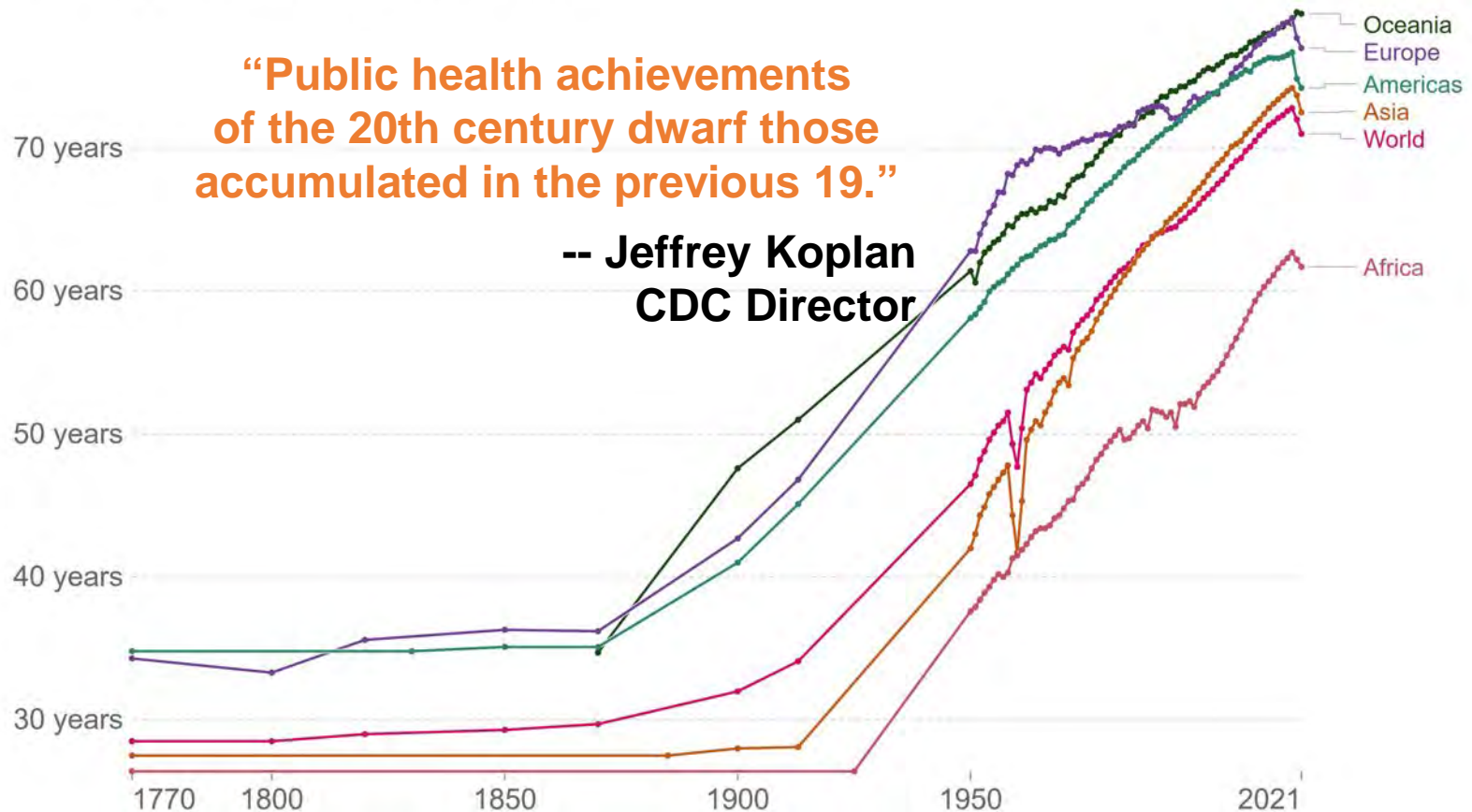
What are the dynamic and democratic dimensions of this work?

Rhodes R. Limiting human violence: an emerging scientific challenge. Sarewitz D, editor. Living With the Genie: Governing Science and Technology in the 21st Century; New York, NY: Center for Science, Policy, and Outcomes; 2002.

Milstein B. Hygeia's constellation: navigating health futures in a dynamic and democratic world. Atlanta, GA: Centers for Disease Control and Prevention. 2008 April 15. <http://tiny.cc/HygeiasConstellation>

Worldwide Life Expectancy, 1770-2021

Our World
in Data



Source: UN WPP (2022); Zijdemans et al. (2015); Riley (2005)

OurWorldInData.org/life-expectancy • CC BY

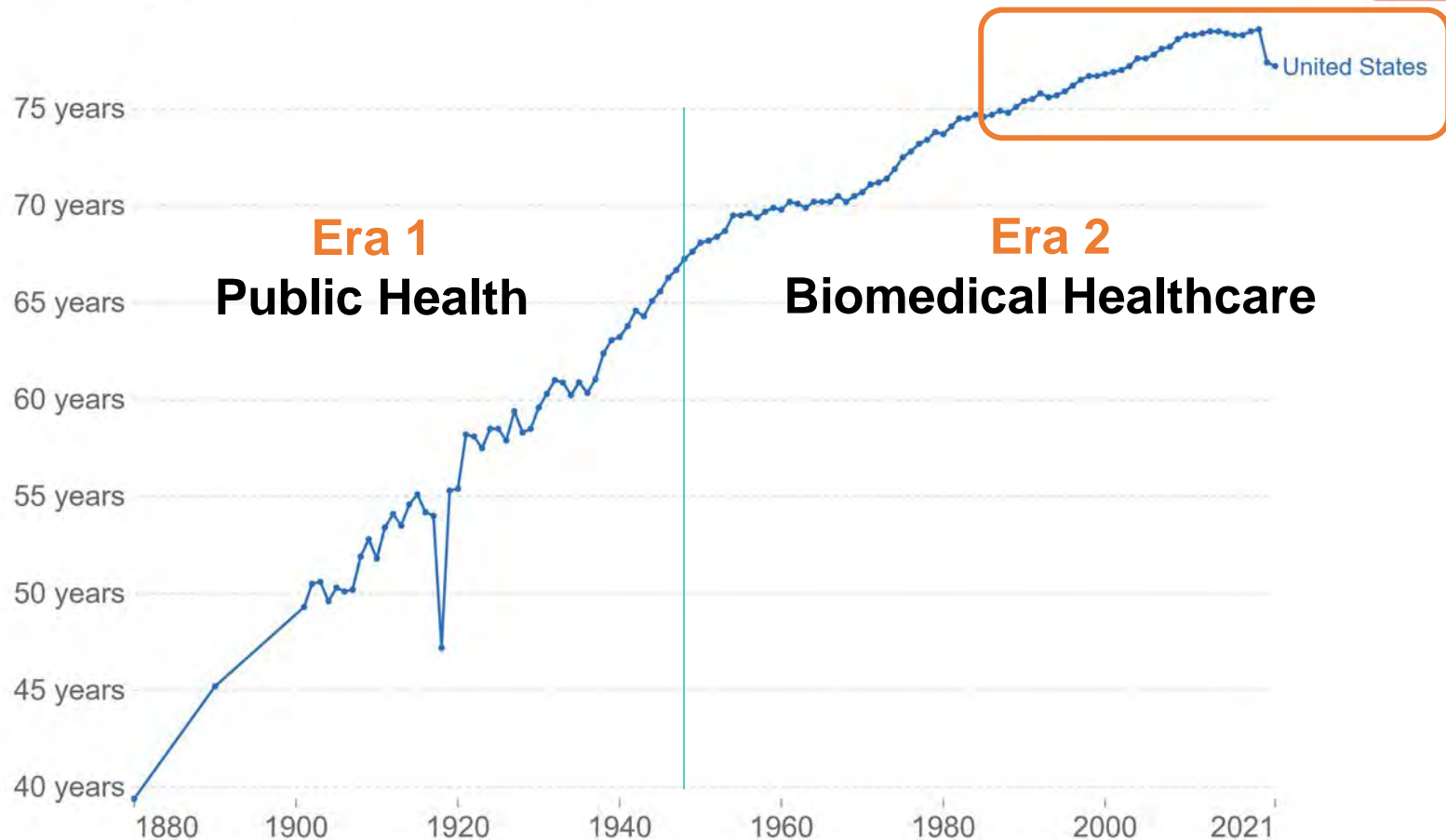
Note: Shown is the 'period life expectancy'. This is the average number of years a newborn would live if age-specific mortality rates in the current year were to stay the same throughout its life.

<https://ourworldindata.org/life-expectancy>

Koplan J. CDC sets millennium priorities. US Medicine 1999:4-7.

US Life Expectancy, 1880-2021

Our World
in Data



Source: UN WPP (2022); Zijdeman et al. (2015); Riley (2005)

OurWorldInData.org/life-expectancy • CC BY

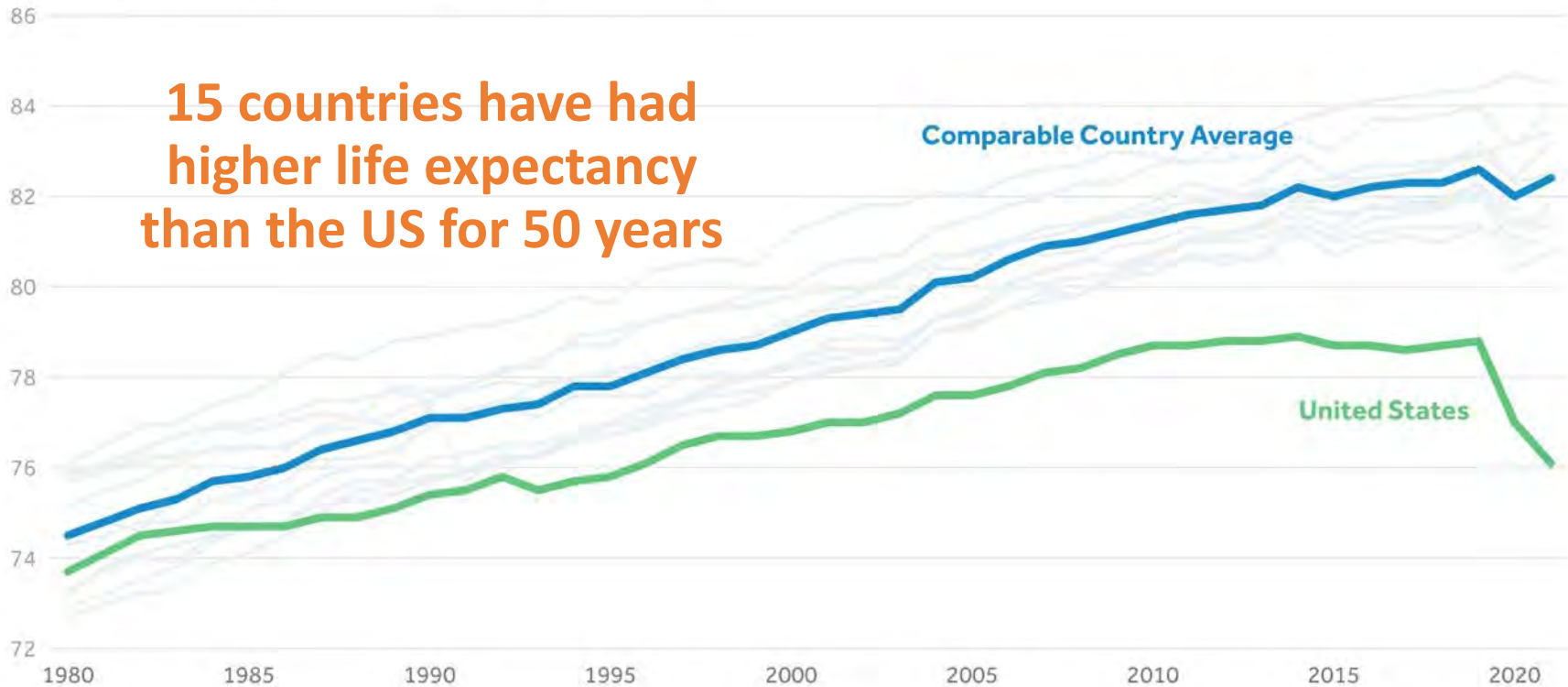
Note: Shown is the 'period life expectancy'. This is the average number of years a newborn would live if age-specific mortality rates in the current year were to stay the same throughout its life.

<https://ourworldindata.org/life-expectancy>

Milstein B. A Brief History of Stewarding Health, Wealth, and Well-Being. ReThink Health; October 6 2019.

<https://www.rethinkhealth.org/wp-content/uploads/2020/04/A-Brief-History-of-Stewarding-Health-Wealth-and-Well-Being-Oct-6-2019.pdf>

Life Expectancy at Birth, 1950-2021



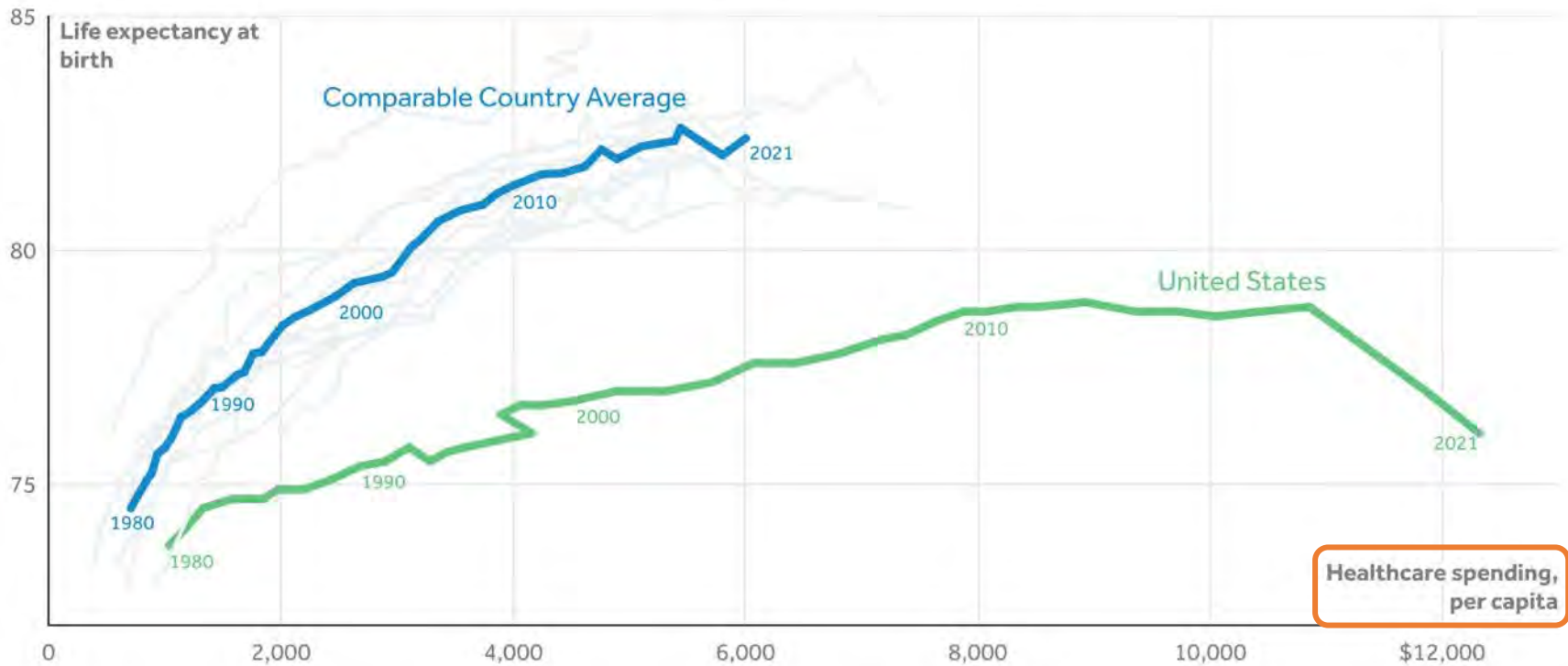
Notes: Comparable countries include: Australia, Austria, Belgium, Canada (except for 2021), France, Germany, Japan, the Netherlands, Sweden, Switzerland, and the U.K. See Methods section of "How does U.S. life expectancy compare to other countries?"

Source: KFF analysis of CDC, OECD, Japanese Ministry of Health, Labour, and Welfare, Australian Bureau of Statistics, and UK Office for Health Improvement and Disparities data

Peterson-KFF
Health System Tracker

<https://www.healthsystemtracker.org/chart-collection/u-s-life-expectancy-compare-countries/#Life%20expectancy%20at%20birth%20in%20years,%201980-2021>

Life Expectancy and Healthcare Spending Per Capita, 1980-2021



Notes: Comparable countries include: Australia, Austria, Belgium, Canada (except for life expectancy average in 2021), France, Germany, Japan, the Netherlands, Sweden, Switzerland, and the U.K. See Methods section of "How does U.S. life expectancy compare to other countries?"

Source: KFF analysis of CDC, OECD, Japanese Ministry of Health, Labour, and Welfare, Australian Bureau of Statistics, and UK Office for Health Improvement and Disparities data

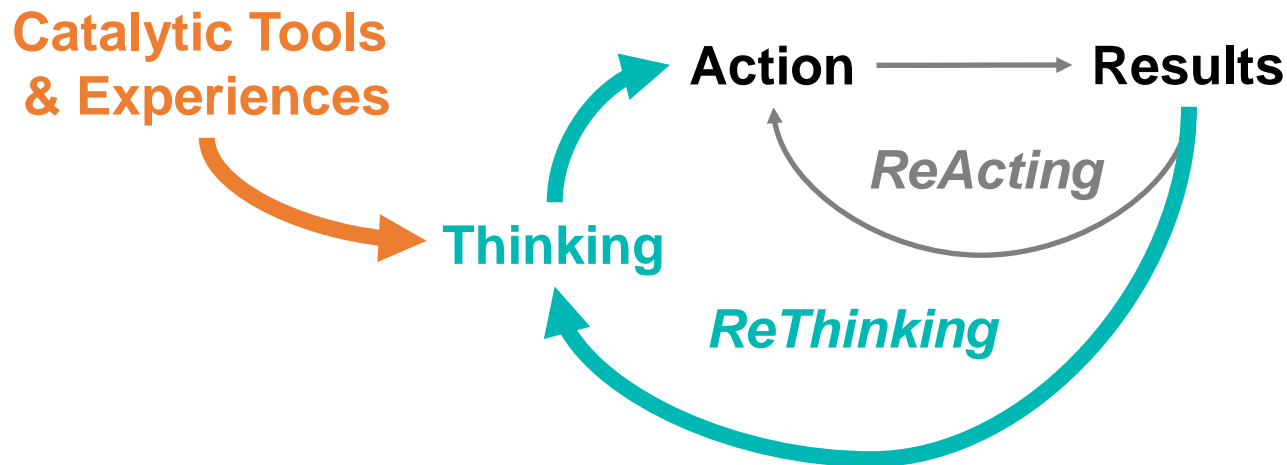
Peterson-KFF
Health System Tracker

<https://www.healthsystemtracker.org/chart-collection/u-s-life-expectancy-compare-countries/#Life%20expectancy%20and%20healthcare%20spending%20per%20capita,%201980-2021>



We join with others to realize a unifying and measurable expectation:
all people and places thriving together—no exceptions.

We know that future cannot be achieved with narrow projects or technical fixes. It requires us to **think and act differently.**





We join with others to realize a unifying and measurable expectation: **all people and places thriving together—no exceptions.**

We know that future cannot be achieved with narrow projects or technical fixes. It requires us to **think and act differently.**

Our well-being relies on a system that is not built for everyone to thrive. But it can be transformed if enough of us—individuals and organizations in every sector—see ourselves and each other as **interdependent stewards in a movement for well-being, equity, and racial justice.**



As Systems Collapse, People Rise

**This single dynamic explains
how people with a just cause
can transform failing systems
for the better**

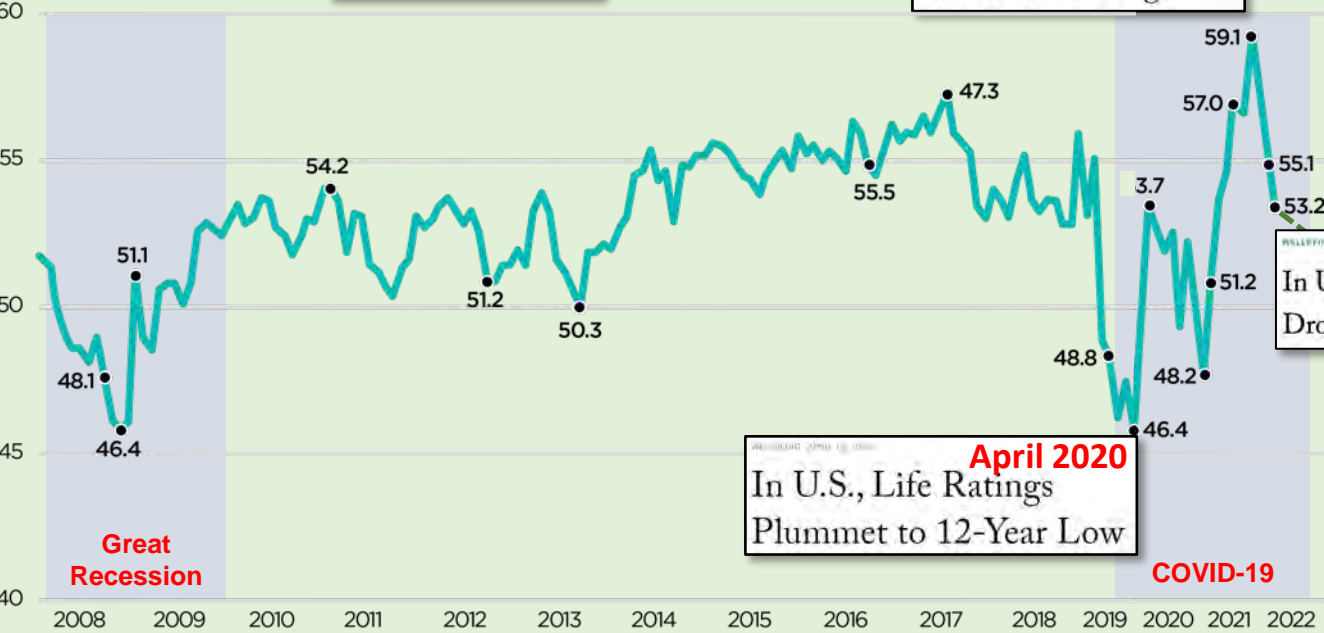
—Thriving Together Springboard,
quoting Otto Sharmer

<http://Thriving.US>

Our Quest to Thrive Together

Life Evaluations of U.S. Adults

■ % Thriving **GALLUP**



June 2021
Americans' Life Ratings Reach Record High

April 2020
In U.S., Life Ratings Plummet to 12-Year Low

June 2022
In U.S., Life Ratings Drop to 13-Month Low

What will it take to reach even greater heights of well-being, equity, and resilience?

2040

SOURCE: Gallup <https://news.gallup.com/poll/351932/americans-life-ratings-reach-record-high.aspx>; <https://news.gallup.com/poll/308276/life-ratings-plummet-year-low.aspx>; <https://news.gallup.com/poll/388682/life-ratings-retreat-close-2021.aspx>; <https://news.gallup.com/poll/391331/life-ratings-drop-month-low.aspx>



Building an Integrated High School Curriculum Focused on the Biology and History of Smallpox



2001 PROCEEDINGS
ATLANTA, GEORGIA, USA



John Heinbokel

jhein@adelphia.net

Waters Center for System Dynamics
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USA

Jeff Potash

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This year's program also includes a special tribute to Dana Meadows, who passed away since our last conference in Bergen, Norway.

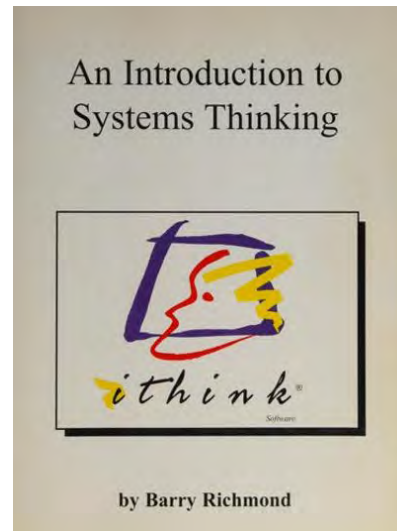


**2001 PROCEEDINGS
ATLANTA, GEORGIA, USA**





2001 PROCEEDINGS
ATLANTA, GEORGIA, USA



Loundsbury Ansah
 Bobachev Cavana Rees Hawe Mckelvie Matchar
 Resnick Morrison Mcdonnell Wolstenholme
 Rahmandad Sabounchi Hammond
 Hovmand Stuntz Jones Schoenberg
 Goodman Sastry Sawin Hussein
 Rouwette Stermann Soderquist Bean
 Seville Metcalf Niles Homer Hirsch
 Osgood Wile Kaplan
 Forrester Meadows Ulrich Lich Galea
 Lane Richardson Richmond Thompson Tebbens
 Andersen MacDonald Wakeland Jalali



SCORES OF SD PROJECTS

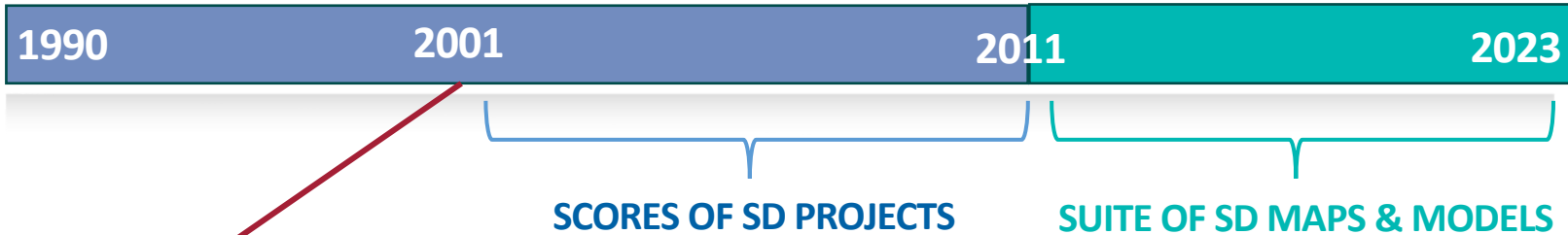
SUITE OF SD MAPS & MODELS



2001 PROCEEDINGS
ATLANTA, GEORGIA, USA

~50 SD projects

- Small maps + \$\$\$\$ industrial-strength models
- Aspiration + data + engagement
- User interfaces, interactive experiences, storytelling
- Training, facilitation, educational universities
- Publications, documentation, validation
- Evaluation (and awards)



2001 PROCEEDINGS
ATLANTA, GEORGIA, USA

Solid SD builds on and goes beyond...

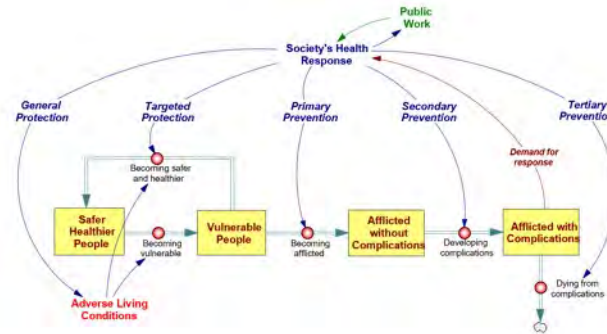
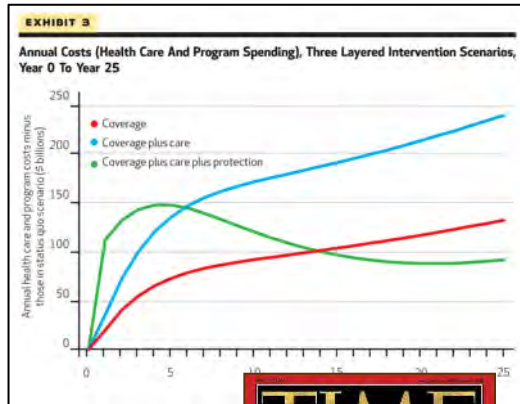
- Surveillance
- Epidemiology
- Demography
- Ethnography
- Economics
- Evaluation
- Policy design
- Communications

CDC Projects Focused on System Science (circa 2009)

- **Infection dynamics**
Smallpox, anthrax, HIV, STD, TB, polio, SARS, influenza, malaria, etc.
- **Chronic diseases and risks**
Diabetes, obesity, hypertension, heart disease, stroke, tobacco, diet, physical activity, stress, alcohol, oral health, sleep, preventive care, etc.
- **Mental health**
Continuum of positive well-being to mental disorders over the life-course
- **Environmental health**
Air, water, soil, heat, radiation, climate change, etc.
- **Preparedness**
Biological, radiological, chemical, environmental, etc.
- **Violence and injury**
Child maltreatment, sexual assault, trauma care, etc.
- **Reproductive health**
Maternal, fetal, and infant health
- **Urban health**
Immigration, ethnic diversity, poverty, housing, employment, education, land use, and health
- **Grantmaking strategy**
Timing and sequence of outside assistance to local leaders
- **Upstream-Downstream effort**
Balancing disease treatment with prevention/protection
- **Health system performance**
Relationships among access, cost, quality, equity, and health

Examples of CDC's SD Tools

HEALTHBOUND POLICY SIMULATION MODEL AND GAME



“We are redefining CDC as the nation’s health-protection agency.”

-- Julie Gerberding, CDC Director

Milstein B, Homer J, Briss P, Burton D, Pechacek T. Why behavioral and environmental interventions are needed to improve health at lower cost. Health Affairs. 2011;30(5):823-832. <http://content.healthaffairs.org/content/30/5/823.abstract>

Time 100: the people who shape our world. Time Magazine 2004 April 26.

<https://drupal.academyhealth.org/blog/2012-07/noteworthy-public-health-systems-research-illuminates-prospects-rethinking-local>

Examples of CDC's SD Tools

PREVENTION IMPACTS SIMULATION MODEL (PRISM)



System Dynamics Review
System Dynamics Review vol 27, No 4 (October-December 2011): 412-415
Published online 24 October 2011 in Wiley Online Library
(wileyonlinelibrary.com) DOI: 10.1002/sdr.475

2011 System Dynamics Applications Award

Citation for the winners: Jack Honeycutt, Bobby Milstein, Diane C...

PREVENTING CHRONIC DISEASE
PUBLIC HEALTH RESEARCH, PRACTICE, AND POLICY
Volume 18, E09
FEBRUARY 2021

ORIGINAL RESEARCH
Validation of the Prevention Impacts Simulation Model (PRISM)

Benjamin Yarnoff, PhD¹; Amanda Honeycutt, PhD²; Christina Bradley, MA³; Olga Khavjou, MA¹; Laurel Bates⁴; Sarah Bass⁵; Rachel Kaufmann, PhD, MPH²; Lawrence Barker, PhD²; Peter Briss, MD, MPH²

- Related Publications**
- Using simulation to compare established and emerging interventions to reduce cardiovascular disease risks in the United States.
 - Using simulation to compare 4 categories of intervention for reducing cardiovascular disease risks to action: From model to action: using a System Dynamics model of chronic disease risks to action.
 - A 'whole of system' approach to compare options for CVD interventions in counties: Proceedings from the workshop on estimating the contributions of Sodium reduction to death.
 - A System Dynamics model for planning cardiovascular disease interventions: Simulating and evaluating local interventions to improve cardiovascular health.
 - Modeling the local dynamics of cardiovascular health: risk factors, context, and community.

Outcome	5-Year results	10-Year results	20-Year results
♥ Coronary heart disease events averted	460	960	2,080
🧠 Strokes averted	230	510	1,170
👤 Deaths averted	150	340	880
💰 Medical costs averted (2021\$)	\$18,830,000	\$45,415,000	\$125,733,000
⚙️ Productivity costs averted (2021\$)	\$82,191,000	\$193,680,000	\$507,665,000
👁️ Total costs averted (2021\$)	\$101,021,000	\$239,095,000	\$633,398,000

<https://prism-simulation.cdc.gov/app/cdc/prism/#/> and <https://systemdynamics.org/prism/>

Yarnoff B, Honeycutt A, Bradley C, et al. Validation of the Prevention Impacts Simulation Model (PRISM). Prev Chronic Dis. 2021;18:E09.
https://www.cdc.gov/pcd/issues/2021/20_0225.htm

Honeycutt AA, Yarnoff B, Tayebal Z, Glasgow L, Hacker K. Using the Prevention Impacts Simulation Model to Estimate Long-Term Impacts of Multisector Community Partnerships' Efforts to Address Social Determinants of Health. Prev Chronic Dis. 2023;20.



STEWARDS

Stewards are people and organizations who work with others to create conditions that everyone needs to thrive together, beginning with those who are struggling and suffering. **Everyone can be a steward.**

Who Are Stewards?

<https://rippel.org/shared-stewardship/>

Amplifying Stewardship

<http://bit.ly/AmplifyingStewardship>

Pulse Check on Shared Stewardship:

<https://rippel.org/pulsecheck/>

Thriving Together Through

Shared Stewardship:

<http://tiny.cc/SharedStewardshipVideo>



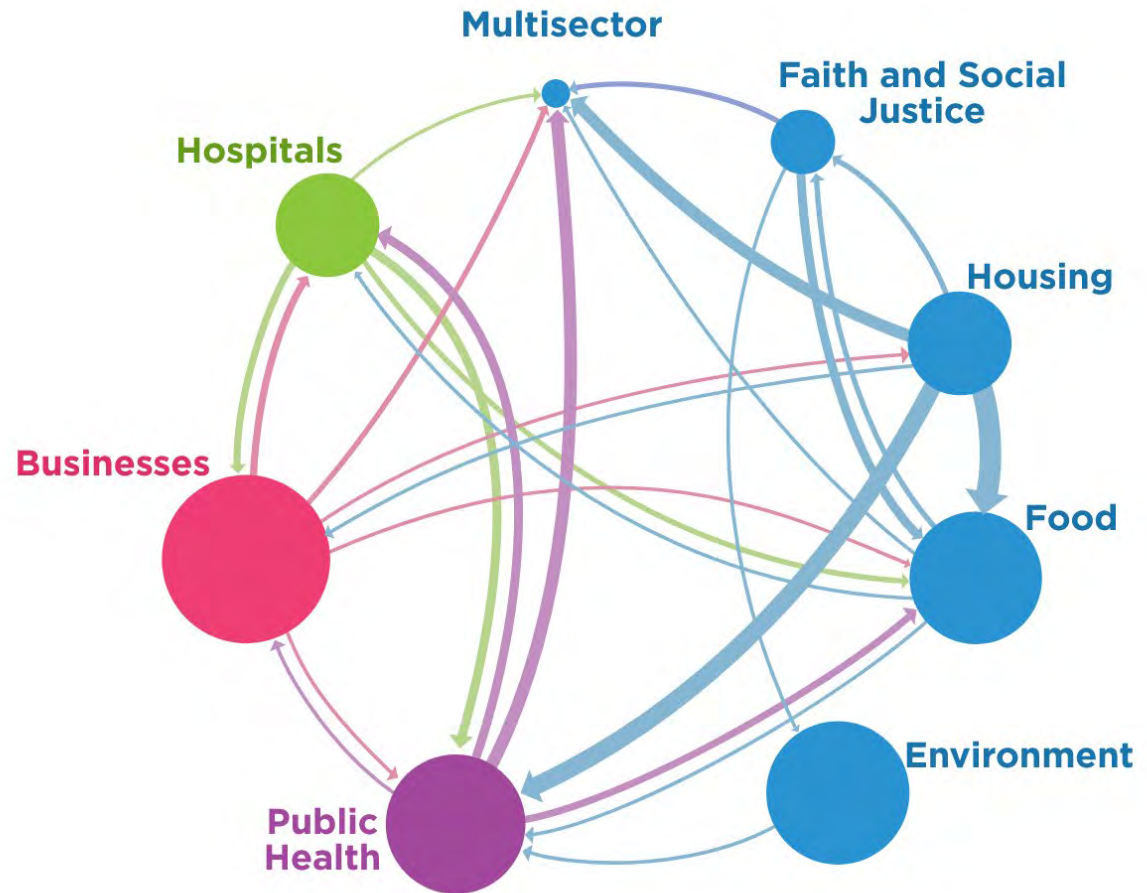
Visit
Rippel Foundation

Visit
ReThink Health



2021 Pulse Check on Shared Stewardship for Thriving Together Across America

Seven Signs of Stewardship on the Rise





Who Are Stewards?
<https://rippel.org/shared-stewardship/>

Amplifying Stewardship
<http://bit.ly/AmplifyingStewardship>

Pulse Check on Shared Stewardship:
<https://rippel.org/pulsecheck/>

Thriving Together Through
Shared Stewardship:
<http://tiny.cc/SharedStewardshipVideo>

Vital Conditions for Health and Well-Being

- Thriving Natural World 
- Basic Needs for Health & Safety 
- Humane Housing 
- Meaningful Work & Wealth 
- Lifelong Learning 
- Reliable Transportation 
- Belonging & Civic Muscle 



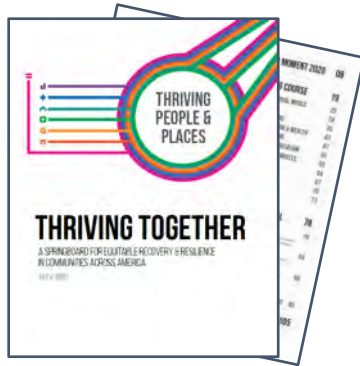
Belonging & Civic Muscle is at the center because it is both a vital condition and a practical capacity that is necessary for equitable success in every other kind of work



<http://Thriving.US>; <https://rippel.org/vital-conditions-for-health-and-well-being/>; a [growing cadre](#) of organizations now explicitly focus on establishing the vital conditions.

Pairing Coordinated Federal & Non-Government Actions

Non-Government Organizations *Thriving Together Springboard*



[Thriving.US](https://thriving.us)

Federal Plan *52 agencies*

Informs federal programs, policies, and resources that give communities flexibility to tailor solutions to local needs



[Health.gov](https://health.gov)

All people and places thriving together—no exceptions

State and Local Action



A Watershed Moment



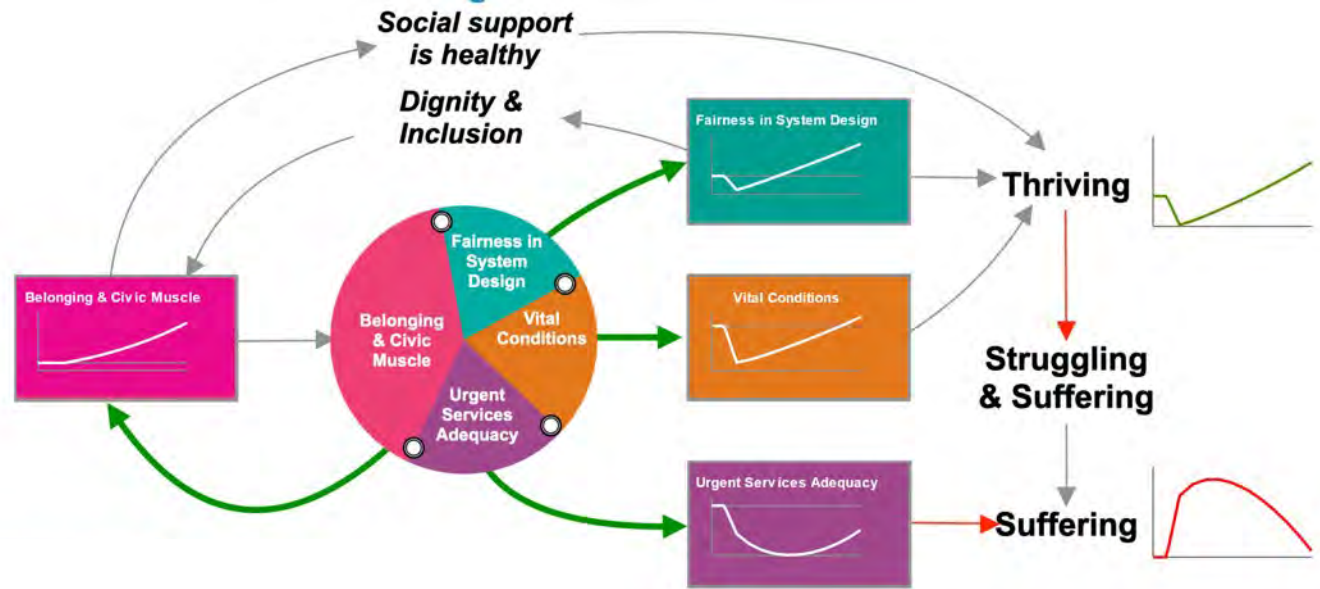
HealthAffairs
FOREFRONT

“Never before have so many federal agencies and legions of leaders across America been able to organize around the same set of vital conditions in a common quest to thrive together.”

Milstein, et.al. Vital Conditions Move the Social Determinants Agenda into Widespread Action. *Health Affairs Forefront*. <http://tiny.cc/VitalConditionsHA>

Next Gen Tools for Shared Stewardship

Thriving Together Model (Interactive Theater and Multisolving Investment Analysis)



First dynamic model to track population-level changes in well-being separately by race/ethnicity

Milstein B, Homer J, Soderquist C. How Can a Community Pursue Equitable Health and Well-Being after a Severe Shock? Ideas from an Exploratory Simulation Model. *Systems*. 2022;10(5):158. <https://www.mdpi.com/2079-8954/10/5/158>

ReThink Health. Thriving Together Theater: <https://rippel.org/thriving-together-theater/>

A Legacy Moment



Federal Plan for Equitable Long-Term Recovery and Resilience for Social, Behavioral, and Community Health

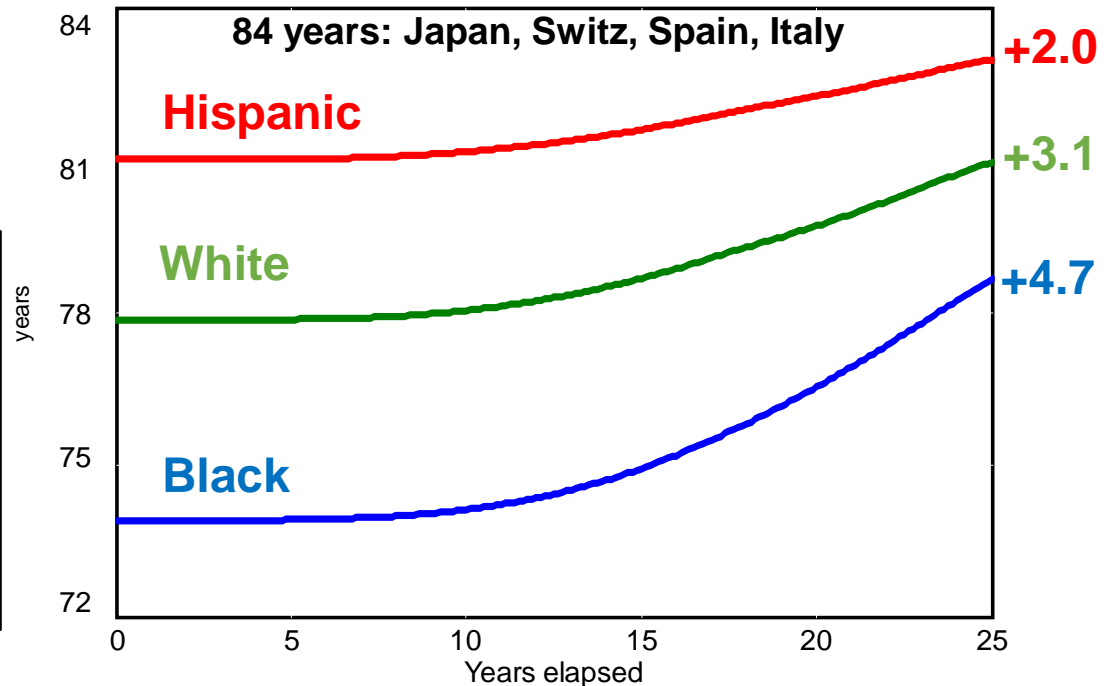
Recommendations

This document contains recommendations (cross-cutting and for all vital conditions) for the Federal Plan for Equitable Long-Term Recovery and Resilience for Social, Behavioral, and Community Health.

78 Proposed Recommendations		
	Vital Conditions	Recommendations specific to that vital condition
10 Cross-Cutting Recommendations for actions that transcend the vital conditions	Belonging & Civic Muscle	8
	Thriving Natural World	10
	Basic Needs for Health & Safety	17
	Humane Housing	9
	Meaningful Work & Wealth	12
	Lifelong Learning	5
	Reliable Transportation	6

ReThink Health's Thriving Together Model Illustrative ELTRR Scenario

US LIFE EXPECTANCY BY RACE/ETHNICITY



Forthcoming...

Legacies for Living Together



We inherit vital conditions from our predecessors—their legacies are the starting points for our lives.

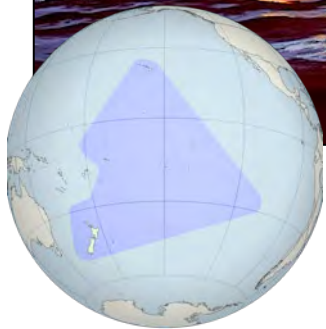
We also possess enormous capacities to transform current and future conditions, for better or for worse.

What legacies would make us “good ancestors” for generations to come?

Milstein, et.al. Vital Conditions Move the Social Determinants Agenda into Widespread Action. *Health Affairs Forefront*. <http://tiny.cc/VitalConditionsHA>

Wayfinding

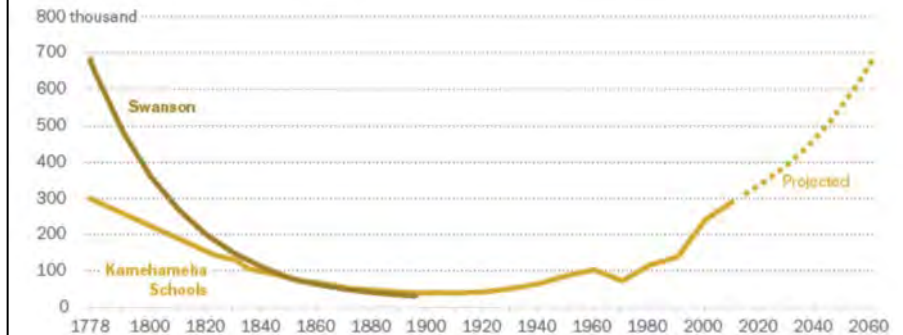
Ancient Practice of Goal-Directed Movement



Native Hawaiian Population Makes a Comeback

Native Hawaiian Population Makes a Comeback After Sharp Decline

Estimates of the Native Hawaiian population in Hawaii



Note: Swanson data counts only Native Hawaiian population; Kamehameha Schools includes those who are Native Hawaiian alone and in combination with other races in 2000 and after.

Sources: David Swanson, "A New Estimate of the Hawaiian Population for 1778, the Year of First European Contact"; Kamehameha Schools 2014. Ka Huaka'i: 2014 Native Hawaiian Educational Assessment. Honolulu: Kamehameha Publishing

PEW RESEARCH CENTER

**Stewards of the Native Hawaiian renaissance
changed the course of their collective destiny**

Pew Research Center. Native Hawaiian Population Makes a Comeback. April 2, 2015. https://www.pewresearch.org/fact-tank/2015/04/06/native-hawaiian-population/ft_15-03-25_hawaii/
Thompson, Nainoa. "Hökūle'a and Native Hawaiian Health." May 23, 2016. https://www.nlm.nih.gov/news/Hokulea_Lecture.html

Polynesian Voyaging Society. "Mālama Honua Worldwide Voyage." 2016. <https://www.hokulea.com/worldwide-voyage/>



“Our well-being and survival depend on *social navigation* – our ability to direct the course of change toward a negotiated set of valued conditions.”

***Can you see a future?
Do you believe you can navigate there?***

**-- Nainoa Thompson
Master Navigator
Polynesian Voyaging Society**

Milstein B. Hygeia's constellation: navigating health futures in a dynamic and democratic world. Atlanta, GA: Centers for Disease Control and Prevention. 2008 April 15. <http://tiny.cc/HygeiasConstellation>

Thompson, N. Spring 2021 Commencement Address. University of Hawai'i at Mānoa. May 16, 2021. <https://m.youtube.com/watch?v=V91OmYrAgrM&vl=en-US>

Thompson, N. The Hōkūle'a Voyages: What Can Evaluators Learn from the Renaissance of Polynesian Voyaging? Evaluation 2000, Honolulu, HI, November 1, 2000.

<https://www.dropbox.com/s/13qq4crxvxf2mne/Nainoa%20Thompson%2C%20Welcome%20to%20AEA%202000%20%28Thompson%29.wav?dl=0>