

# Early Detection, Diagnosis, and Prevention of CVD Public Health / Health Systems Perspective

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Chair World Heart Federation Roadmap on Prevention of CVD

Among People Living with Diabetes

# About the Presenter

Laurence S. Sperling, MD

## DISCLOSURES

*No potential conflicts  
related to this  
presentation*



Opinions expressed do not necessarily reflect the opinions of the US Dept of HHS, the Public Health Service, the Centers for Disease Control and Prevention, or the presenters affiliated institutions. Use of trade names is for identification only and does not imply endorsement by any of the groups named above.

# Early Detection, Diagnosis, and Prevention

- Challenges
- Solutions / Actions

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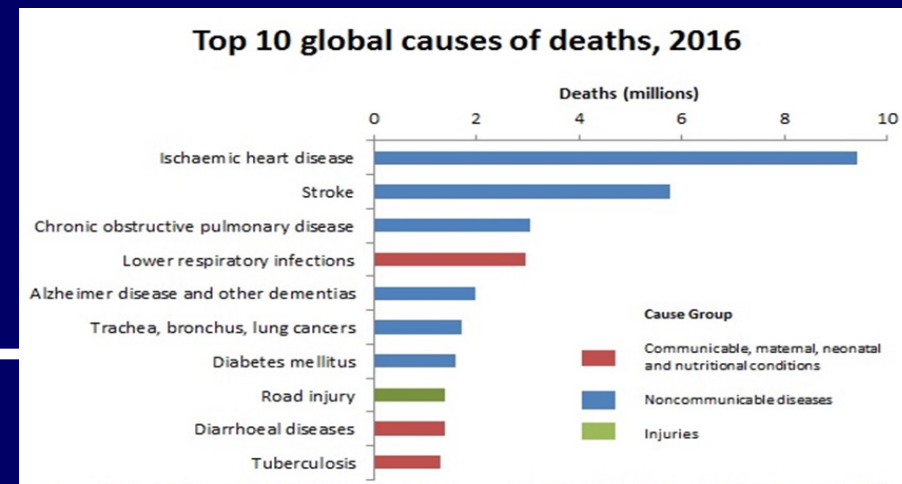
# Changing Global Burden of Disease in a Global Economy

**1990**

1. Lower respiratory infection
2. Diarrhea
3. Perinatal
4. Major depression
5. Ischemic heart disease
6. Cerebrovascular

**2020**

1. Ischemic heart disease
2. Major depression
3. Road traffic accidents
4. Cerebrovascular
5. COPD



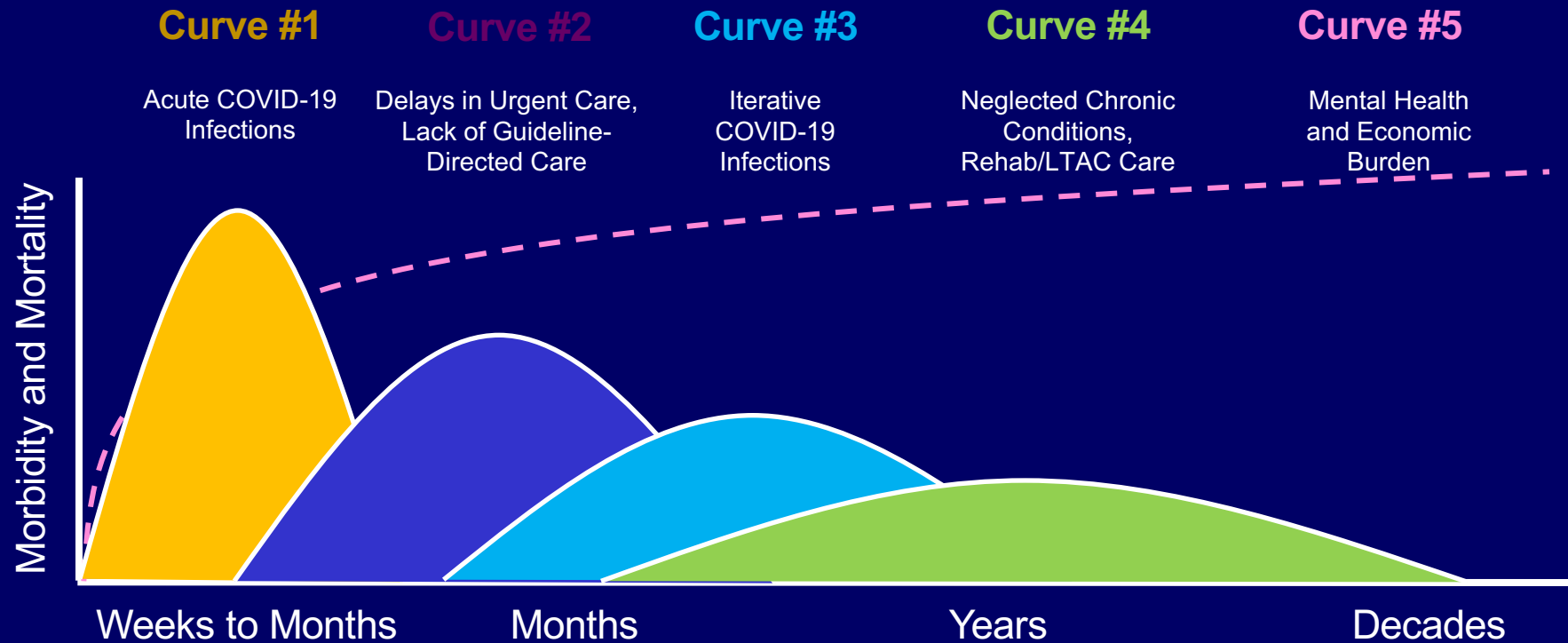
Murray and Lopez. *Lancet*. 1997;349:1498.

Source: Global Health Estimates 2016: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2016. Geneva, World Health Organization: 2018.

“CVD is the biggest epidemic (pandemic)  
ever known to mankind.  
We need strategies to address epidemics...”

Salim Yusuf  
President WHF  
Europrevent 2013, Rome

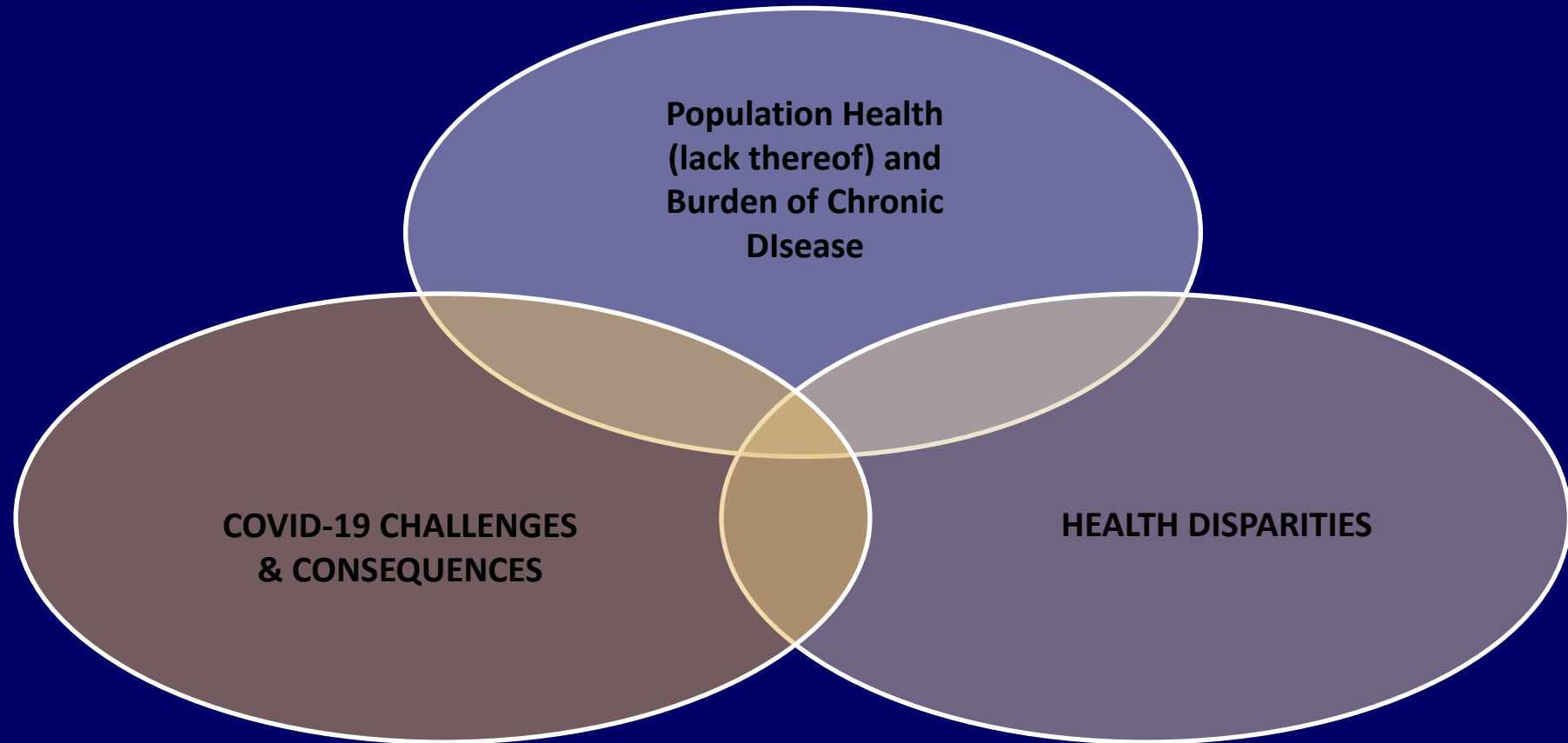
# Multiple Impacts of the COVID-19 Pandemic



Adapted with permission from Victor Tseng, MD

Kohli P, Virani SS. Surfing the Waves of the COVID-19 Pandemic as a Cardiovascular Clinician. *Circulation*. 2020 Jul 14;142(2):98-100..

# CONVERGING SYNDEMICS



Horton R. Lancet 2020;396:874.



**ON MY MIND**

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**The Future of Cardiovascular Prevention**

**Unprecedented Times**

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Laurence S. Sperling, MD 

“risk for COVID-related morbidity driven by interaction of viral illness with unwell population. Need to invest more than ever in ESSENTIAL services like CV disease prevention, population health initiatives, robust public health programs...”

# Early Detection, Diagnosis, and Prevention

- Challenges
- Solutions / Actions

# What must be different?

- Accountability
- Innovation
- Alignment of Incentives
- Action Plans leading to Equitable Implementation

## **Promoting and Addressing Global Heart Health**

- Importance of patient / community voice and stories from the heart
- Need to identify challenges and solutions
- Call for policy action and investment prioritization

# Policy Priorities for CVD

- Healthy Aging  
– “healthspan”
- Workplace  
Impact
- Health System  
Resilience
- Health Equity

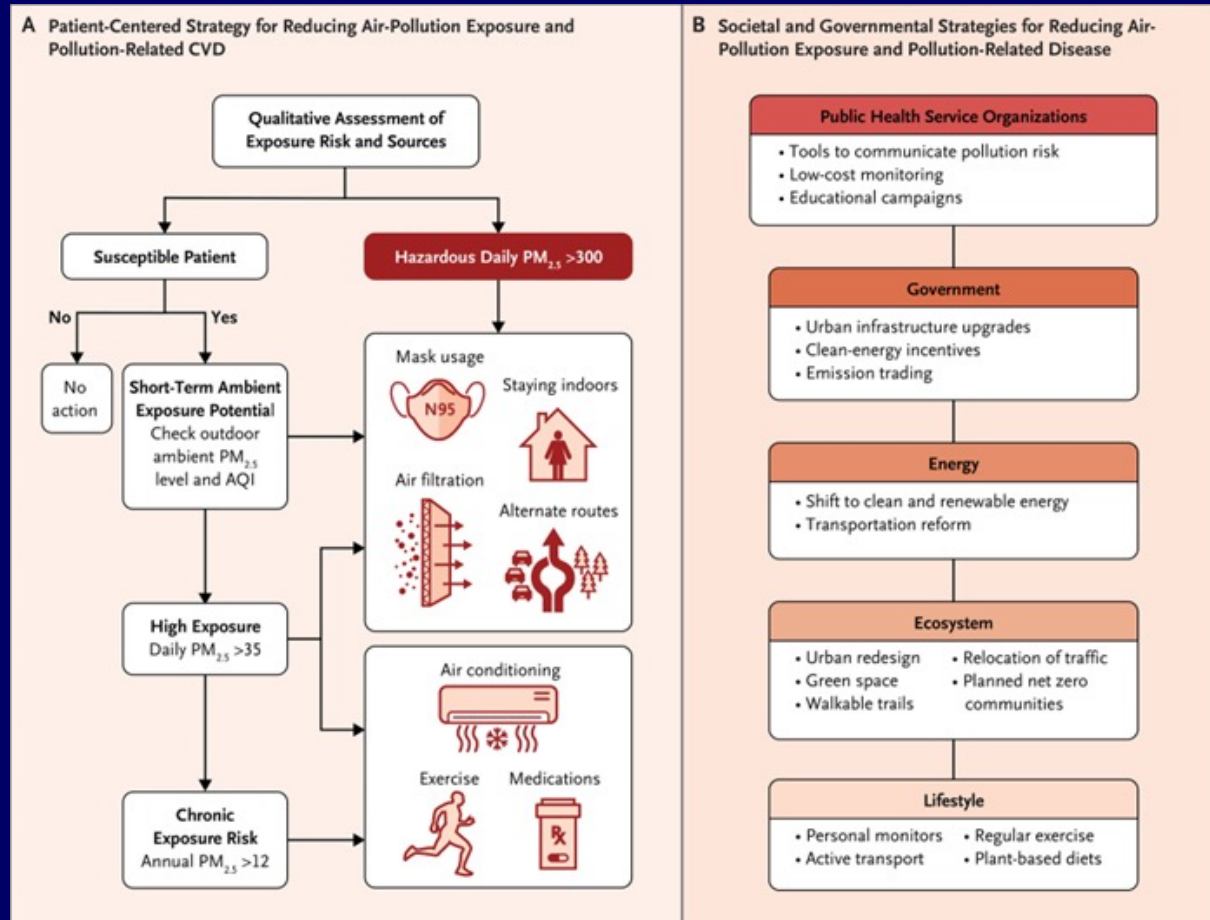


Health Policy Partnership. Thought Leadership Forum on Cardiovascular Disease. September, 2022

# Strategies for Preventing Pollution-Related CVD

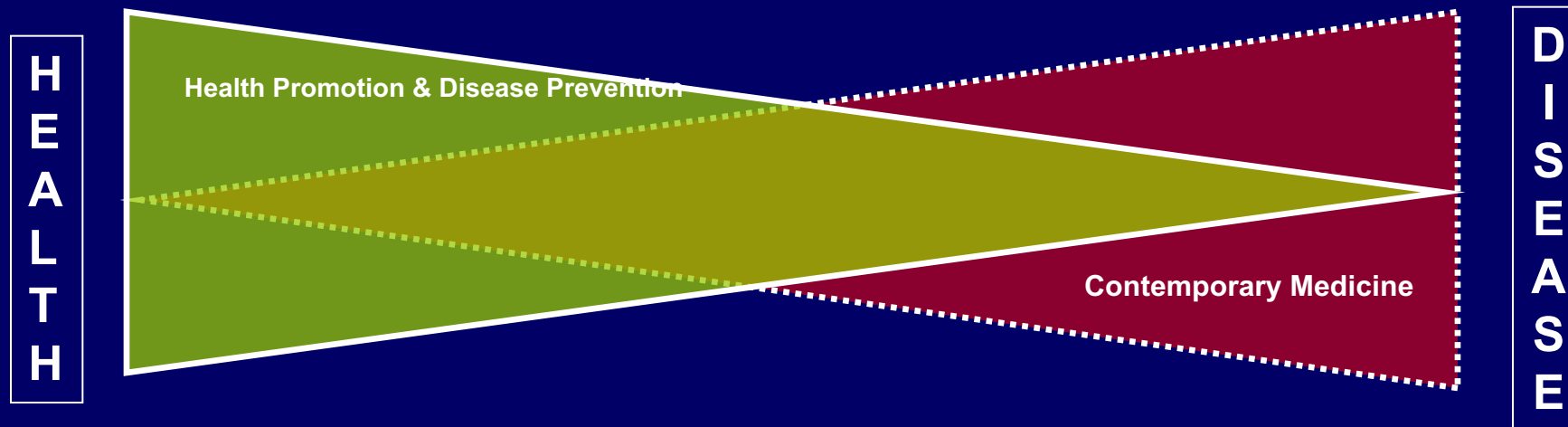
- Pollution major, potentially preventable risk factor for CVD
- Patient-centered strategies
- Systems, societal, and governmental strategies

Rajagopalan S, Landrigan PJ.  
NEJM 2021;385;1881-1892



# Focus on CV Population Health: The Health/Disease Continuum

Knapper JT, Quyyumi AA, Mensah GA, Sperling LS. JACC 2015;66:960-7



# Social Determinants of Health: Challenges & Interventions

Schultz WM, Kelli HM, Sandesara P, Quyyumi AA, Mensah GA, Sperling LS. *Circulation*, 2018.137;2166-2178

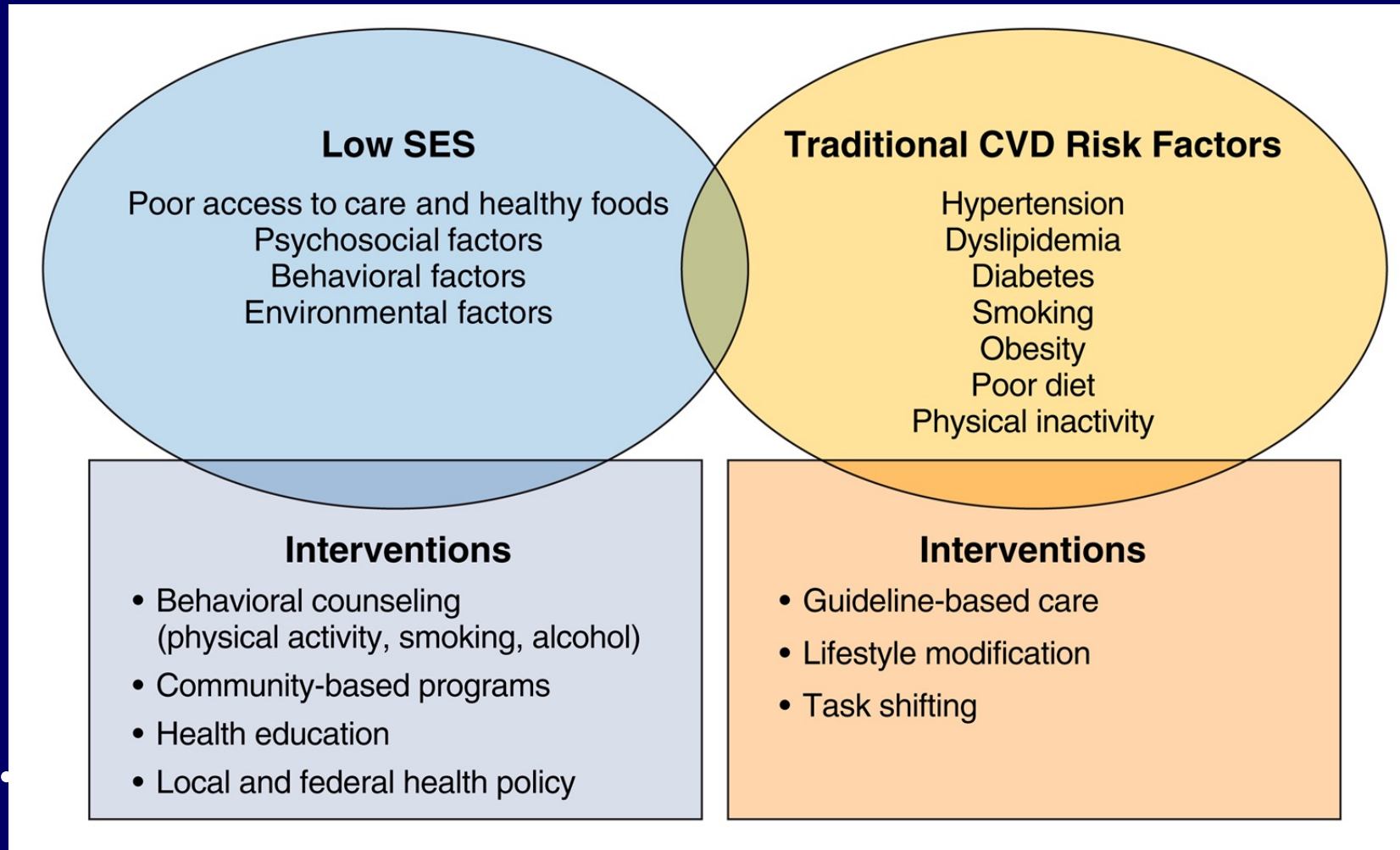
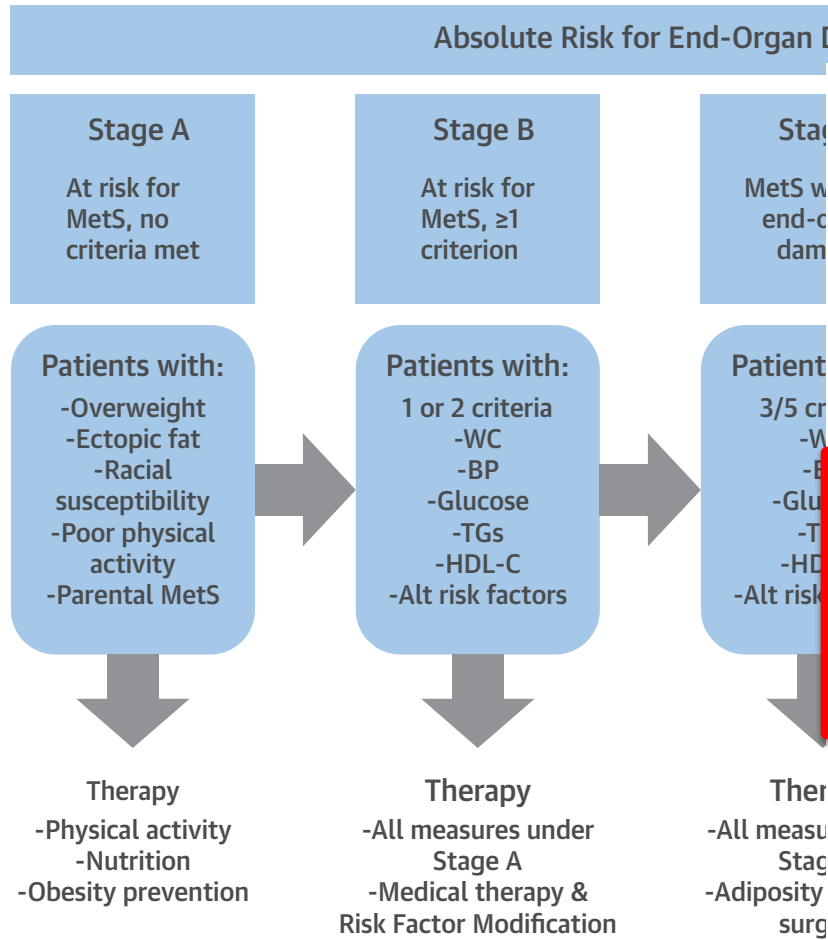




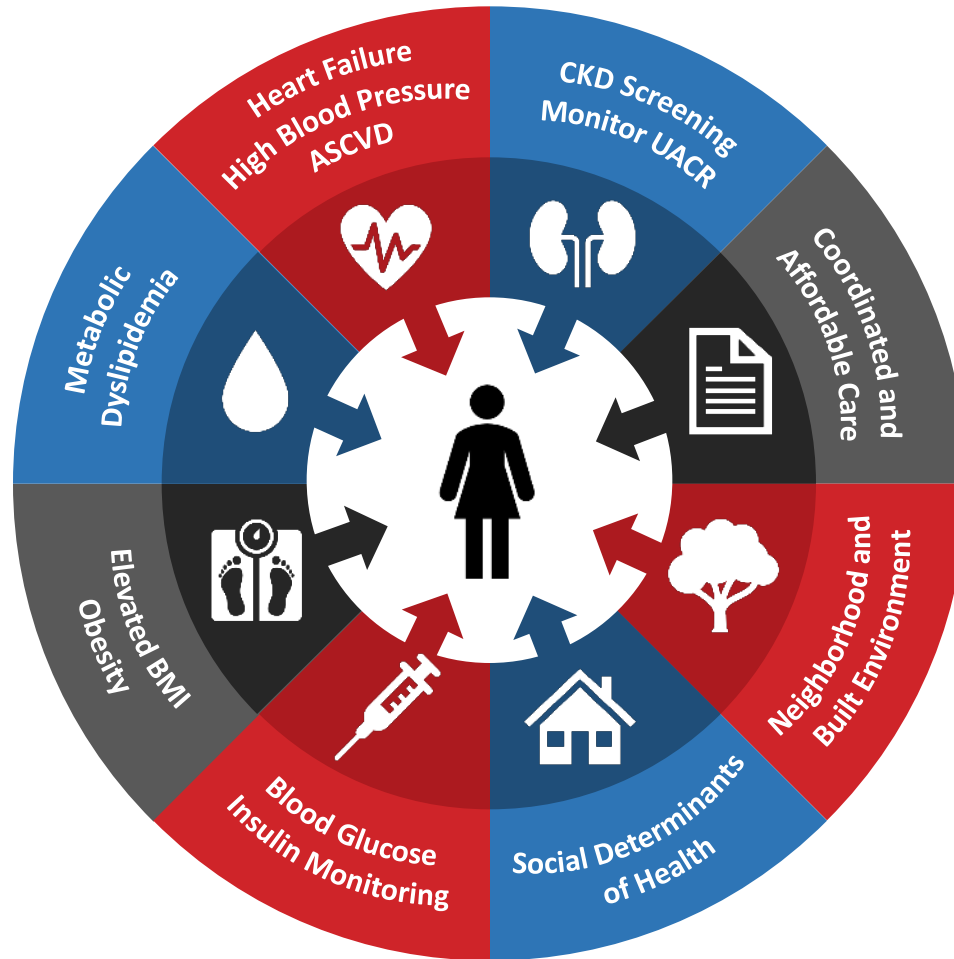
FIGURE 2 Stages in the Evolution of MetS and Recommended Therapy by Stage



MetS. A greater emphasis on assessing nutritional quality and levels of physical activity, with a focus on filling the gap between public health approaches and implementation in clinical practice, will be needed. Care models will continue to incorporate ACOs, but uncertainty exists as to how the ACA will affect MetS care in the future. It is foreseen that health care will transition to a greater degree from the clinic to the community, improving access to care, and that there will be a broadening of stakeholders to include public health, community, and industry sectors. Screening and performance metrics will enhance implementation of new care models in the future. Finally, the TT affirmed a call to action to encourage ongoing partnerships, funding, and initiatives to improve the lives of people with or at risk for MetS.

# Cardiovascular- Kidney- Metabolic Syndrome

Patient-Centered Implementation  
Focus



**Abbreviations:** ASCVD indicates atherosclerotic cardiovascular disease; BMI, body mass index; CKD, chronic kidney disease; and UACR, urine albumin-creatinine ratio.



# WORLD HEART FEDERATION ROADMAP FOR THE PREVENTION OF CVD AMONG PEOPLE LIVING WITH DIABETES

Informing health systems approaches to CVD by  
prioritizing practical, proven, cost-effective action



*Introducing*

## A Roadmap on the prevention of CVD among people living with diabetes

2 September 2019

Mitchell S, et al. Global Heart 2019; 14: 215-44

WORLD HEART FEDERATION ROADMAP

gRECS



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## A Roadmap on the Prevention of Cardiovascular Disease Among People Living With Diabetes

Sharon Mitchell\*, Belma Malanda<sup>†</sup>, Albertino Damasceno<sup>‡</sup>, Robert H. Eckel<sup>§</sup>, Dan Gaita<sup>||</sup>, Kornelia Kotseva<sup>%,#</sup>,  
James L. Januzzi<sup>\*\*</sup>, George Mensah<sup>††</sup>, Jorge Plutzky<sup>‡‡</sup>, Maksym Prystupiuik<sup>§§</sup>, Lars Ryden<sup>|||</sup>, Jorge Thierer<sup>¶¶</sup>,  
Salim S. Virani<sup>###\*\*\*</sup>, Laurence Sperling<sup>†††</sup>

Geneva, Switzerland; Brussels, Belgium; Maputo, Mozambique; Aurora, CO, USA; Timisoara, Romania;  
London, UK; Boston, MA, USA; Bethesda, MD, USA; Kyiv, Ukraine; Stockholm, Sweden; Buenos Aires,  
Argentina; Houston, TX, USA; Atlanta, GA, USA

Together with

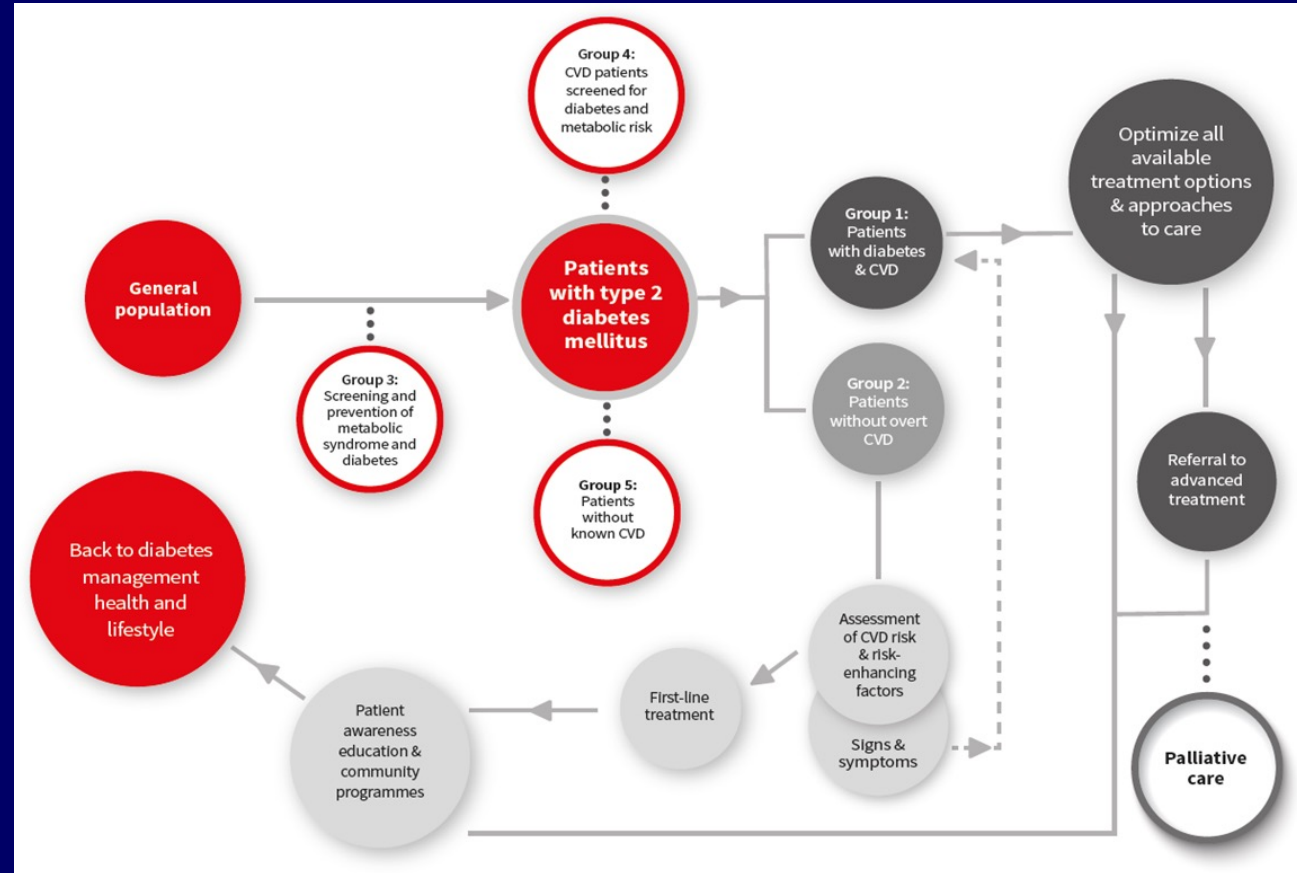
ESC Congress Paris 2019  
World Congress of Cardiology



# Ideal Pathway of Care

- Prevention, screening, treatment, monitoring, and follow-up
- 5 groups

Mitchell S, et al. Global Heart 2019; 14: 215-44



## Understanding and Addressing Barriers

- Accessibility
- Acceptability (social / cultural)
- Affordability
- Availability

Mitchell S, Malanda B, Damasceno A, et al. Global Heart 2019;14: 215-44

# Who is the roadmap for?

## An integrated approach to patient care



# Implementation

## GLOBAL IMPLEMENTATION

Facilitation of national stakeholder discussions through Roundtables



Facilitation of national scorecards



Planning & research of evidence informed solutions by creating a global network



Providing a toolkit for implementation of solutions



WHF CVD, Diabetes, and Obesity Roundtable  
Ghana, 3/30/23

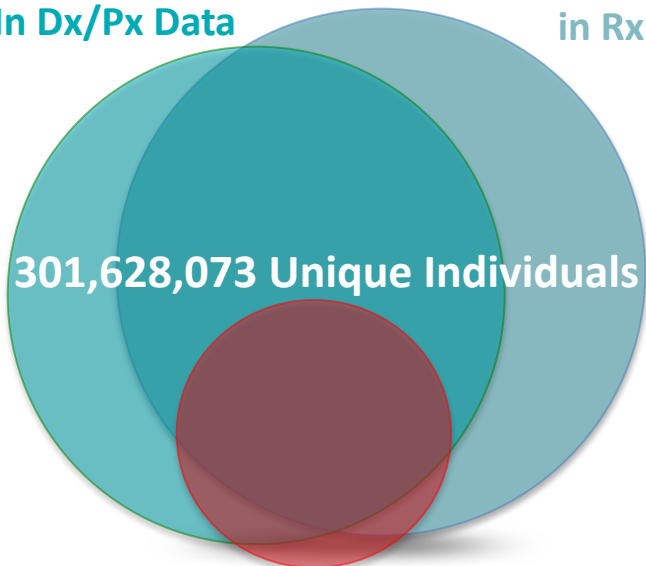
- Importance of Minister of Health
- Leverage / engage traditional healers
- Develop CVD scorecards



# Finding high risk individuals through machine learning

FHF National Database

244,654,515  
Unique Patients  
In Dx/Px Data



112,826,465 Patients in Lx Data

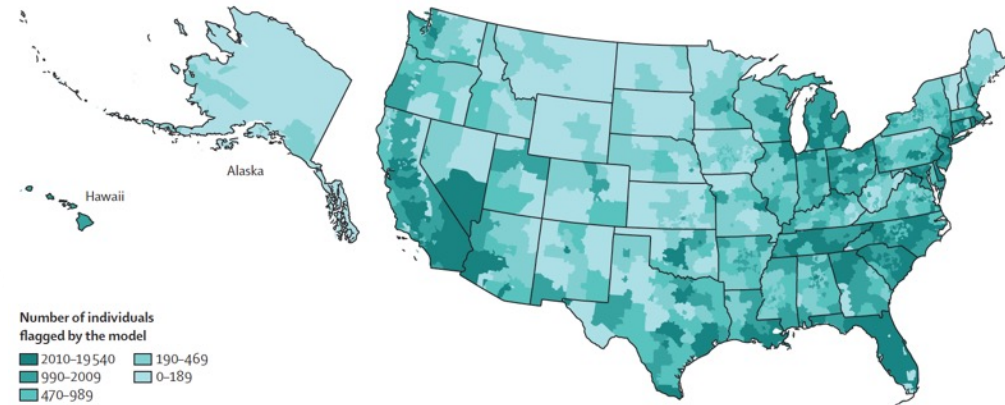


Machine Learning Model

241,434,171  
Unique Patients  
in Rx Data

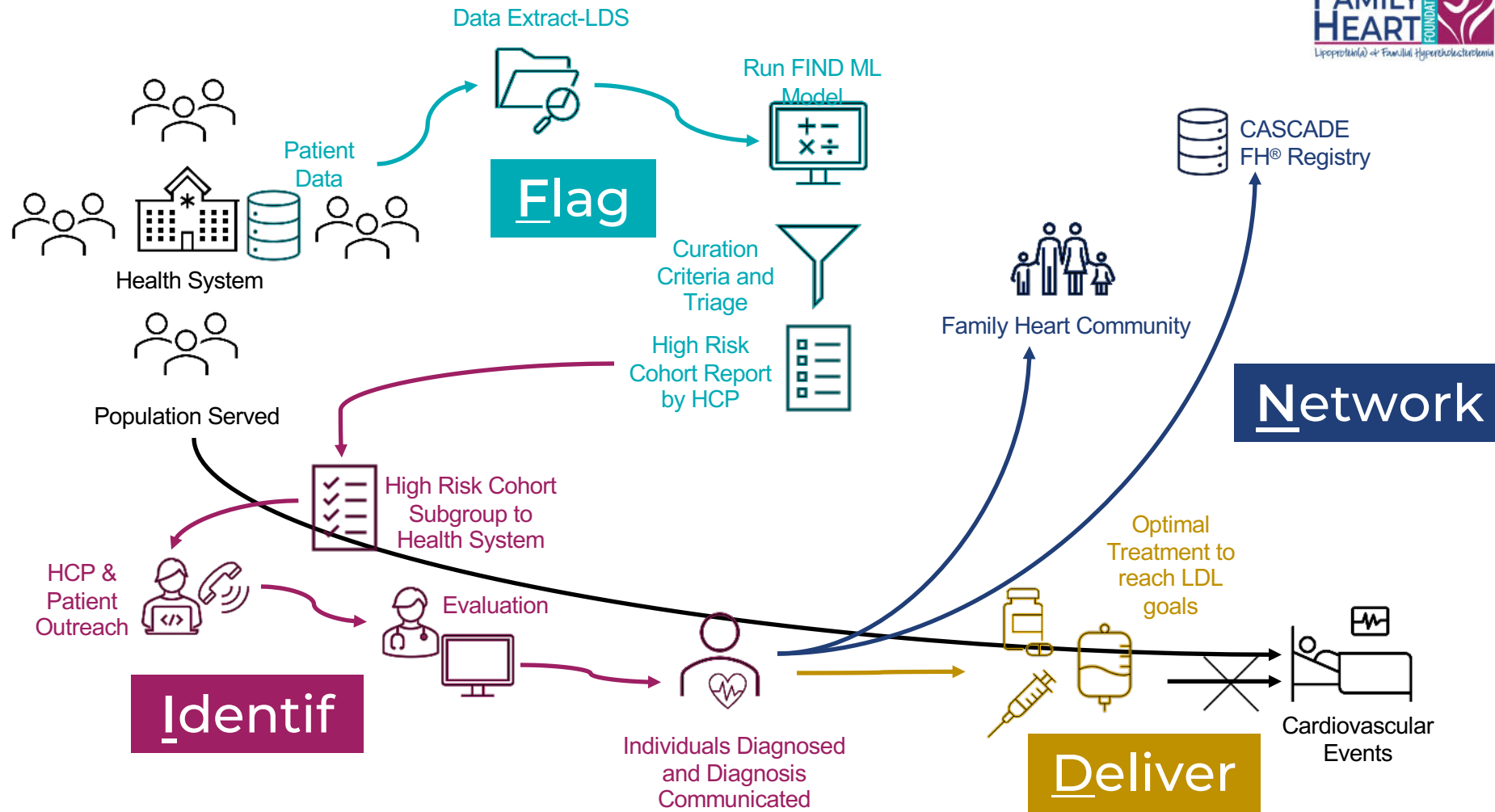


FIND and Prevent Heat Map



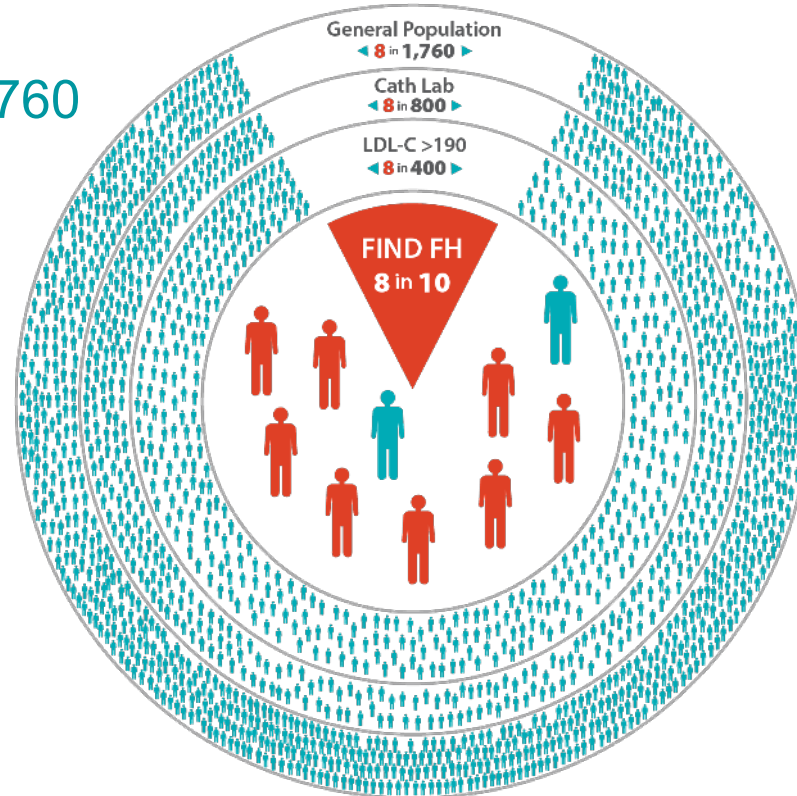
FIND FH® Lab & Claims Model Developed by The FH Foundation

Claims Data Source: IMS Health Real World Data: LRx longitudinal prescriptions and Dx medical claims



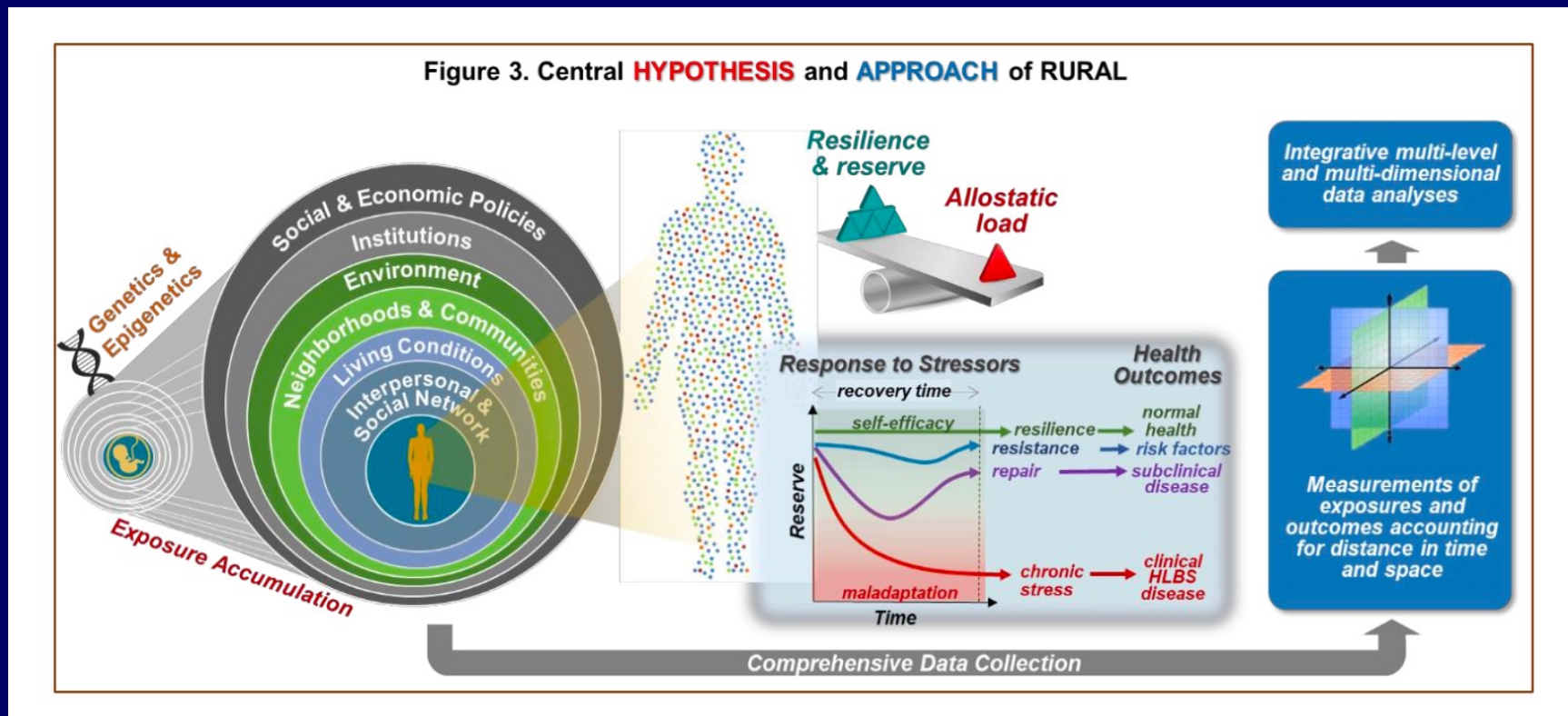
# Precision screening

**Screen 10 to find 8,**  
instead of screening 1,760



# Risk Underlying Rural Areas Longitudinal (RURAL) Cohort Study

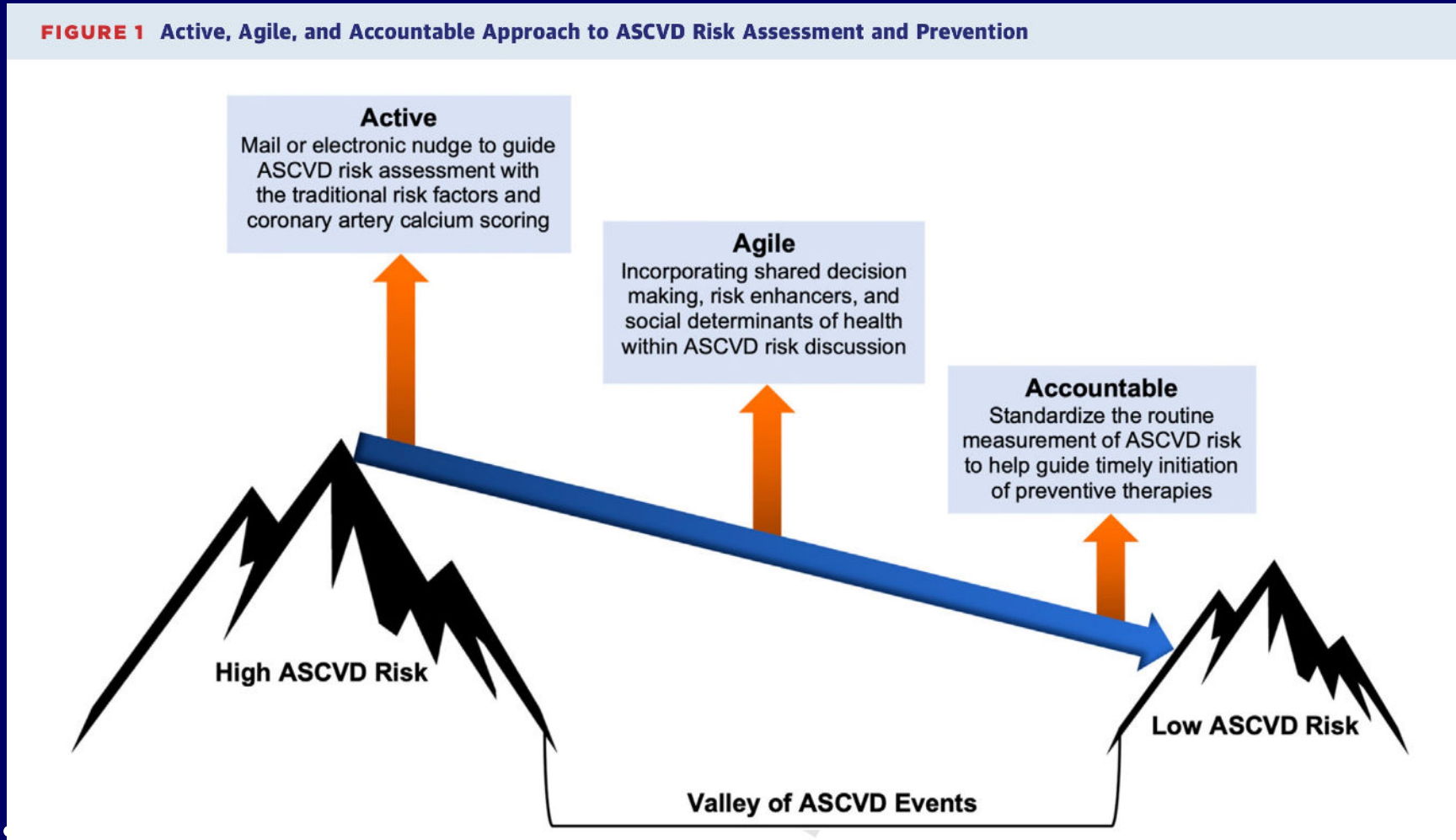
<https://theruralstudy.org>



# Primary ASCVD Prevention: Optimally Active, Agile, and Accountable

Sperling LS, Jain VJ, Razavi AC. JACC Advances. 2023

**FIGURE 1** Active, Agile, and Accountable Approach to ASCVD Risk Assessment and Prevention



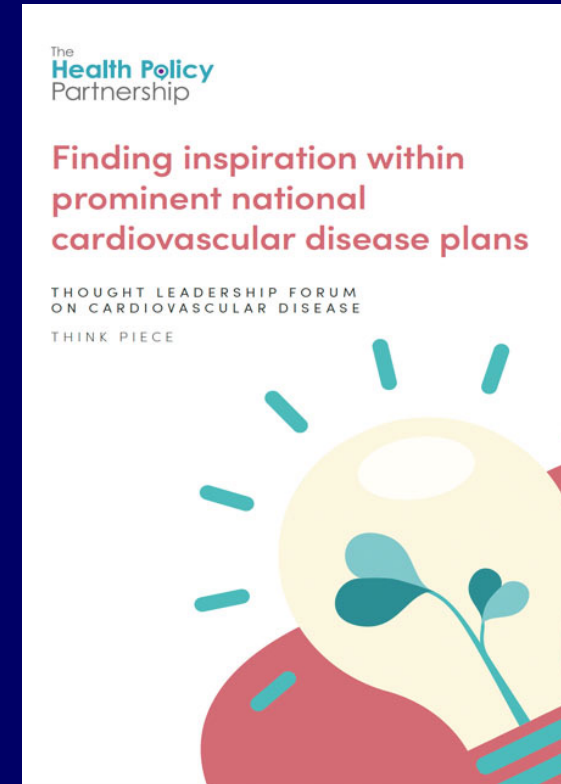
# What Characterizes Prominent National CVD Plans?

- Implementation and governance
- Measurable policy targets
- Population-level prevention and health promotion
- **Screening and early detection**
- **Risk factor management**
- **Early Diagnosis**
- CVD management and treatment
- Healthcare delivery
- Digital health approaches; effective use of data solutions, CVD research, innovation, wider determinants of health



# What Characterizes Prominent National CVD Plans?

- Early identification of people at risk of developing CVD is critical to ensure swift intervention
- Population-level screening and early detection should be a key component of CVD policy
  - Cardio 50- across all 11 Italian regions
  - National screening program for FH in Slovenia
  - Preventive Medical Examinations, Russia
- Following Identification of Individuals Living with CVD RF's, comprehensive management and timely preventive treatment can avert or slow the progression of disease





## ESC CardioPolicy Group: Prioritizing CVD with National Action Plans

- Representatives from 47 national Cardiac Societies
- Aim: creating a healthier future by promoting CV health policy
- Create national action plans to ensure CV health receives policy prioritization proportional to CVD burden
- Address lack of investment
  - Europe’s “Beating Cancer Plan”
  - U.S. Cancer “Moonshot”



# Million Hearts<sup>®</sup> 2027 Priorities

## Building Healthy Communities

Decrease **Tobacco Use**

Decrease **Physical Inactivity**

Decrease **Particle Pollution Exposure**

## Optimizing Care

Improve Appropriate **A**spirin or **A**nticoagulant Use

Improve **B**lood Pressure Control

Improve **C**holesterol Management

Improve **S**moking Cessation

Increase Use of **C**ardiac Rehabilitation

## Focusing On Health Equity

Pregnant and  
Postpartum  
Women with  
Hypertension

People from  
Racial/Ethnic  
Minority Groups

People with  
Behavioral Health  
Issues Who Use  
Tobacco

People with  
Lower Incomes

People Who Live  
in Rural Areas or  
Other 'Access  
Deserts'

# Precision Public Health

- **Precision Medicine**
  - Providing right treatment to right patient at right time
- **Precision Public Health**
  - Providing right intervention to right population at right time

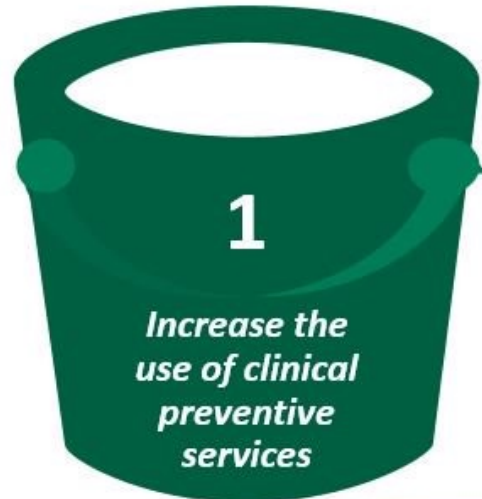
Khoury MJ, et al. Am J Prev Med 2016;50(3):398-401

# The Future?

J. Auerbach. J Public Health Manag Pract 2016;22(3): 215-18

## THE 3 BUCKETS OF PREVENTION

**Traditional Clinical  
Prevention**



**Innovative Clinical  
Prevention**



**Community-Wide  
Prevention**



**Health Care**

**Public Health** 

SOURCE: Auerbach J. The 3 Buckets of Prevention. J Public Health Management Practice  
2016;22(3): 215-18. [http://journals.lww.com/jphmp/Citation/publishahead/The\\_3\\_Buckets\\_of\\_Prevention\\_.99695.aspx](http://journals.lww.com/jphmp/Citation/publishahead/The_3_Buckets_of_Prevention_.99695.aspx)

# Approach to Cardiovascular & Cardiometabolic Epidemics / Pandemics ?

- Identify vectors / complex causes
- Identify barriers / roadblocks / factors that propagate
- Goals:
  - Control
  - Elimination
  - Eradication

Thanks [lsperli@emory.edu](mailto:lsperli@emory.edu)

