Surveillance and Prevention of NCDs: 

*Applying LHS Principles to Kidney Disease*

Rajiv Saran, MBBS, MD, MRCP, MS  
Florence E. Bingham Professor of Nephrology  
Professor of Medicine and Epidemiology  
Director, USRDS Coordinating Center  
University of Michigan  
Ann Arbor, Michigan
The Problem – Non-Communicable Disease

- NCDs (obesity, cardiovascular diseases, cancer, respiratory diseases, diabetes, kidney disease, substance abuse and mental illness) have emerged as the largest global health crisis of this century
  - Nearly 70% of deaths
  - Huge Cost – Trillions
  - Current priority is mostly downstream crisis management (MI, Stroke, ESRD, advanced illnesses) – due to misaligned financial incentives
  - Upstream primary prevention is neglected
  - Large scale multi-sectoral approaches are necessary
CKD – Remains the ‘Cinderella’ of Chronic Diseases...


– Cardiovascular Disease
– Cancer
– Diabetes Mellitus
– Respiratory Disease
– Mental Illness
– CKD (not directly mentioned)
Why Kidney Disease as the Prototypical NCD?

• Simple to diagnose
  – Simple laboratory tests
• Well recognized risk factors
• High prevalence (14.8% of US adult population)
• Low awareness
• High morbidity and mortality
• ESRD a devastating complication
• Very high societal cost
  ~120 billion/year for Medicare and the VA health system alone
The Solution – The Big Picture

Prioritize Upstream Prevention of NCDs!
Key Premise – 1

• Establishing comprehensive (health and disease) surveillance/intelligence/information systems
  – *is fundamental* to disease prevention or optimal disease management at the health system, OR population-level
  – Key is to identify a well demarcated denominator population
    • Health system (the area served by)
    • County
    • State
    • Country
    • International
Robust and Sustained Public Health Surveillance

“Ongoing, systematic, collection, analysis and interpretation of health data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know”

Thacker and Berkelman, 1988
Surveillance vs LHS:
A Striking Resemblance!
Key Premise – 2

• Robust surveillance systems allow comprehensive mapping of hot spots and lend themselves to population-level risk prediction and analysis of contextual factors

  – *Is there a problem?*
  – *Where is the problem?*
  – *Who has the problem*
  – *Why is there a problem?*
  – *What can be done?*
Key Premise – 3

• Once you know where the *disease and its risk factors* are localized (‘hot-spot’ geospatial analysis and prediction analytics) one can initiate outreach *and* innovative interventions at population-level to target individuals or geographic regions at high risk

  – Population health *management* (*reactive approach*)

  – Population health *improvement* (*proactive approach*)
Key Premise – 4

• Multi-stakeholder partnership and involvement is vitally important to effect change
  – Health systems and public health workforce synergy critical
  – Community needs assessment
  – Sustainable strategy development
  – Sustainable large scale funding
  – Implementation of multi-pronged interventions
  – Ongoing surveillance & research
Multisectoral, Committed Partnerships
What are UM’s Core Strengths as it relates to Kidney Disease Prevention?
Comprehensive Surveillance
Of Kidney Disease
In the United States
Mission

• High Quality Epidemiology & Surveillance of Kidney Disease for the United States
  – “The Finest Kidney Disease Data System in the World!”

• Conduct and Stimulate Research, Inform Public Health Priorities and Policy:
  – Conduct and Facilitate High Impact Research that impacts policy or practice
www.cdc.gov/ckd/surveillance
The Veterans Affairs Renal Information System

(VA-REINS)
Background

• High prevalence and high cost of kidney disease amongst US veterans

• A need was recognized to develop a comprehensive kidney disease data system that could potentially serve both operational and research needs for the Department of Veterans Affairs

• The VA REnal INformation System (VA-REINS) was conceptualized and developed by a team at the University of Michigan, in collaboration with a VA Advisory Group, under a contract with the Department of Veterans Affairs’ Office of Innovation
VA-REINS Conceptual Framework – 4 Data Sources

**VA**
- VA Corporate Data Warehouse
  - CDW-VISTA Data Domains (Production & Raw databases)
  - Vital Status Files (VSF)
  - Managerial Cost Accounting (MCA – formerly DSS)
  - HERC Data
- IPEC Dialysis Dashboard
- VA Medicare Linked Data

**External**
- External Resources
  - National Centers for Medicare and Medicaid Services (CMS) ESRD Data Sources operated by UM-KECC
  - Includes Organ Procurement and Transportation Network (OPTN) data, Claims and CROWNWeb (replaced SIMS and Fistula First as of May 2012)
  - Could be replaced by USRDS-VA linked standard analysis files

**VA REINS - Renal Information System**
*Individual patient records linkable to other VA resources*
Multidisciplinary Team Approach Critical!