It’s a balmy spring morning in Madison, WI

May, 2018
SHOW

• Baseline data on ~11,500 Wisconsin (~1,200 older than 65 years) residents recruited over 10 years
  – Blood samples, environmental data, life-style
  – Mini cognitive and verbal fluency tests
• In response to an RFP, obtained funding for and conducted follow-up telephone survey with repeat cognitive tests in 2015
• 121 cases with significant cognitive decline
• Study Design:
  – Nested case-control study, 121 cases and a random sample of controls, baseline info and frozen serum

• Plan to examine:
  – The relation between baseline mercury levels and risk of cognitive decline
  – Whether this association is modified by genetic traits (e.g., APOE and APOC1 promoter polymorphisms)
Prevalence of Obesity (BMI ≥30) in Wisconsin Residents*

*Source: BRFSS, DPH
Prevalence of Obesity (BMI≥30) in Wisconsin Residents*

*Source: BRFSS, DPH
• Use a quasi-experimental design to:
  – Assess temporal trends in obesity prevalence (based on objective measures of body weight/height and fat distribution) in successive representative samples of Wisconsin residents
  – Compare trends in communities…
    • Participating in 2009 Governor’s Obesity Prevention initiative
    • Non participating communities
RFA from NCI

• To assess adherence to screening recommendations for breast cancer
  – New screening tool (serum levels of tumor hypoxia-inducible factor 3-β)

• June 2009 - Medicare includes THIF3-β in list of covered preventive services
SHOW

• Plans a response to RFA to identify patient, physician, and health system factors associated with adherence to THIF3-β screening

• Type II translational project to:
  – Identify all women in SHOW >55 yrs old on June 2009
  – Link to Medicare data for dates of all THIF3-β claims
  – Study how coverage differs according to subject and health care provider characteristics; e.g.:
    • Subject’s minority status, SES, residence (urban/rural)
    • Physician’s gender (AMA data)
    • Quality of physician group’s electronic medical records (Medicare)
survey of the health of Wisconsin

Taking the pulse of Wisconsin
SHOW Goals

Established in 2008 as a *state-of-the-art* infrastructure for population health research in Wisconsin

- Annual health surveys of Wisconsin residents and communities
- Longitudinal follow-up of survey participants
- Flexible design to enable community-specific and community-driven ancillary studies
SHOW Rationale

"The purpose of the conversion funds is to promote public health initiatives that will generally benefit the Wisconsin population."
Framework for Wisconsin's Public Health System Transformation 2000–2010

Shared Vision of Wisconsin’s Public Health System Partners
Healthy people in healthy Wisconsin communities

Mission
To protect and promote the health of the people of Wisconsin

Core Public Health Functions

1. **Assessment**: Determine community strengths and current/emerging threats to the community’s health through regular and systematic review of the community’s health indicators with the public health system partners.

2. **Policy Development**: Establish a community health improvement plan and action steps with the public health system partners to promote and protect the health of the community through formal and informal policies, programs, guidelines, environmental changes, and programs and services.

3. **Assurance**: Address current/emerging community health needs/threats through governmental leadership and action with the public health system partners. Take necessary/reasonable action through direct services, regulations, and enforcement. Evaluate the improvement plan and actions, and provide feedback to the community.

Essential Public Health Services

1. Monitor health status to identify community health problems.
2. Identify, investigate, control, and prevent health problems and environmental health hazards in the community.
3. Educate the public about current and emerging health issues.
4. Promote community partnerships to identify and solve health problems.
5. Create policies and plans that support individual and community health efforts.
6. Enforce laws and regulations that protect health and insure safety.
7. Link people to needed health services.
8. Assure a diverse, adequate, and competent workforce to support the public health system.
9. Evaluate effectiveness, accessibility and quality of personal and population-based health services.
10. Conduct research to seek new insights and innovative solutions to health problems.
11. Assure access to primary health care for all.
12. Foster the understanding and promotion of social and economic conditions that support good health.
SHOW Rationale

• National surveys (NHANES, NHIS, MEPS)

http://www.cdc.gov/nchs/nhanes.htm
SHOW Rationale

• National surveys (NHANES, NHIS, MEPS)
  But… - Respond to national research priorities
  - Can’t provide State-specific data

• Data at State or County level:
  – Mortality

Mortality from Cardiovascular Disease, Wisconsin, 2003
SHOW Rationale

• National surveys (NHANES, NHIS, MEPS)
  But… - Respond to national research priorities
  - Can’t provide State-specific data

• Data at State or County level:
  – Mortality
  – Hospital discharge data
  – BRFSS
SHOW Rationale

• National surveys (NHANES, NHIS, MEPS)
  - Responds to national research priorities
  - Can’t provide State-specific data

• Data at State or County level:
  – Mortality
  – Hospital discharge data
  – BRFSS
    - Self report
      - No objective data
      - Limited response rates (telephone)
SHOW Rationale

• National surveys (NHANES, NHIS, MEPS)
  - Responds to national research priorities
  - Can’t provide State-specific data

• Data at State or County level:
  – Mortality
  – Hospital discharge data
  – BRFSS

• Dearth of scientifically robust systems for the evaluation of effectiveness of community-level interventions and public health programs
SHOW: The Sample

- Successive annual surveys ($n=1,155$) of representative samples of Wisconsin residents, age 21-74 years
SHOW: The Sample

- Successive annual surveys (n=1,155) of representative samples of Wisconsin residents, age 21-74 years

- Selected by random cluster sampling
  - Census block groups (stratified by congressional district and poverty level)
  - Households (enumerated)
Stage 1: Selection of **Census Blocks Groups** (n=120)

Stage 2: Selection of **Households** (n=10/BG)
SHOW: The Sample

- Successive annual surveys (n=1,155) of representative samples of Wisconsin residents, age 21-74 years
- Selected by random cluster sampling
- In person visit by trained field surveyors
- All age-eligible family members invited to participate
- Informed consent
- Exams at two fixed clinics (Middleton, Milwaukee) and two mobile clinics
Information at the individual level

- Home and field center interview (CAPI), self-administered questionnaire
  - Sociodemographics, medical and family history, behaviors, reproductive history (women), stress, discrimination, mental health, oral health, health care access/utilization, screening and prevention, perceptions about community, medications
- Weight/height, waist and hip circumference
- Blood pressure
- Respiratory function (peak flow meter)
- Bioelectrical impedance analysis (BIA)
- Biological samples:
  - CBC, serum (glucose, HbH1C, cholesterol, HDL, creatinine)
  - Plasma, serum, DNA for long term storage (-80°C)
  - Spot urine for long term storage
SHOW: The Information

• Information at the individual level

• Information at the group level:
  – Family socio-demographics, socioeconomics
  – Household data
  – Geo-coded and linked to neighborhood environmental data:
    • Air, water quality

County Benzene Emissions from Industrial Sources (lb), 2000-2005

- 0 - 4581
- 4582 - 19432
- 19433 - 78308
- 78309 - 166116
- 166117 - 352235

Source: WI AEMS Database
SHOW: The Information

• Information at the individual level

• Information at the group level:
  – Family socio-demographics, socioeconomics
  – Household data
  – Geo-coded and linked to neighborhood environmental data:
    • Air, water quality

Average Nitrate Level by Wisconsin County (mg/l)

- 0.21 - 1.35
- 1.36 - 2.82
- 2.83 - 4.69
- 4.70 - 6.39
- 6.40 - 9.89

Source: DNR – Ground water Retrieval Network
SHOW: The Information

- Information at the individual level
- Information at the group level:
  - Family socio-demographics, socioeconomics
  - Household data
  - Geo-coded and linked to neighborhood environmental data:
    - Air, water quality
    - Community characteristics
    - Local regulations (e.g., smoke free environments)
    - Schools, community programs
    - Quality/price of foods in grocery stores and restaurants
    - Land use, community design, traffic patterns
Figure 1. Disconnected and connected community environments.
Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars

Lawrence D. Frank, PhD, Martin A. Andresen, MA, Thomas L. Schmid, PhD


Figure 2. Probability of obesity in relation to land-use mix.
SHOW Annual Surveys

Monitoring trends in State health outcomes

At the end of year 5 can do X-sectional analyses with ~6,000 subjects
SHOW Annual Surveys
E.g. in 2009, Drs. Martinez-Donate, Partington (UWM), and Glanz (Emory) obtained an OAC grant to conduct NEMS-WI in communities selected by SHOW.
In 2011, Drs. Van Sickle, Malecki, and Gern obtained NIH funding to study interaction of genetics and micro-environments in relation to inhaler use (GIS) in children with asthma.
In 2014, Drs. Fiore and Nieto obtained NIH funding to measure cotinine in stored serum samples to study the impact of smoke-free environments in communities around Wisconsin.
Community SHOWs

2012  Menominee community-wide program to improve nutrition and PA

Mini-SHOW in Menominee households before program (individual’s behaviors, BMI, cholesterol levels, NEMS)

2013-15  Program carried out

2016  Repeat Menominee Mini-SHOW

Permits rigorous way to evaluate program effectiveness:
- Before and after intervention in Menominee
- Comparison with trend in the State
Community SHOWs

SHOM
Survey of Health of Milwaukee
A collaborative project between CUPH, MCW, UW-Milwaukee, and UW-Madison
SHOW: Ancillary Studies and Data Sharing Policies

• Ancillary studies
  – Additional data, separate funding. E.g.:
    • Additional questions, exams, household measurements on SHOW participants
    • Recruiting children, older adults in SHOW households
    • Community “mini-SHOWs”
  – Draft policy in www.show.wisc.edu/researchers

• Data sharing
  – Core SHOW data will be made available to qualified researchers/local and state health officials
  – Eventually made a publicly available database
SHOW: Timeline

- 2003: Wisconsin Partnership Fund established
- 2007, January: SHOW funded
- 2007-08: Infrastructure established, protocol developed, personnel hired and trained, NIH Certificate of Confidentiality obtained, survey piloted
- 2008, May: Symposium
- 2008, May: Final IRB approval
- 2008, May: SHOW launched

First Ancillary studies:
- Caregiver strain and cellular aging (Witt)
- Piloting the SHOW Project Community Advisory Board: Partners in Dissemination (Galvao)*

* Funding pending
Enabling evidence-based public health action

www.show.wisc.edu