Epidemiology 1854

Epidemiology 2012

Geolocation

Mobile data collection

Barcode scanning

StatCalc: statistical calculator for epidemiologists
Excellence in surveillance, epidemiology, and laboratory services is a key CDC strategic focus area.
The Vision: Better, Faster, Cheaper

- **Better**: more complete, more detailed, more conditions, wider dissemination, better connection with health care
- **Faster**: quicker reporting, action, and dissemination
- **Cheaper**: computing power, leveraging electronic health records, internet, mobile technologies
Modern surveillance techniques

*Information technology*

- Moore’s Law
- Explosive growth in mobile computing & communications
- Garbage in, garbage out
- Never lose sight of why we’re doing this
“We have lots of information technology. We just don’t have any information.”
Modern surveillance techniques

*Internet panels*

- Facilitates subject recruitment, respondent reporting
- Successfully used in wide variety of studies
- Limitations similar to any self-report survey
- Risk of “professional respondents”
Modern surveillance techniques

HIV surveillance

- New diagnostic testing algorithms
- Improved ability to detect acute “stage 0” infection
- Viral load an increasingly critical measure
  - Clinical outcome
  - Community outcome
Improving health care surveillance

*Electronic health records*

- Facilitates automated disease reporting, registry reporting
  - Correlate with NHANES, other surveillance systems
- Improved real-time monitoring
- Point-of-care tools for clinical decision support
- Can be used to improve population health
Physicians perform more preventive services with EHR reminders

Source: NYCDOHMH. Based on manual chart reviews of 51 small practices, sample of >6,000 patients.

- **Aspirin for heart disease**: Before clinical alerts - 49%, After clinical alerts - 54%
- **Advise smokers to quit**: Before clinical alerts - 26%, After clinical alerts - 30%
- **Cholesterol control**: Before clinical alerts - 39%, After clinical alerts - 52%
- **Blood pressure control**: Before clinical alerts - 49%, After clinical alerts - 56%
Improving health care safety
National Healthcare Safety Network

• Comprehensive medical care surveillance and quality improvement system
  • Provides actionable, real-time data to guide HAI prevention across healthcare settings
  • Used by healthcare facilities, state health departments, CMS, and HHS
• Enrollment open to all types of health care facilities in US
  • >9,100 currently participating
Healthcare-associated infections

More than 1 million infections occur across health care every year

Cost an estimated $30 billion per year

Clostridium difficile infections remain high

14,000 C. difficile infections kill 14,000 people in the U.S. annually
Progress in reducing healthcare-associated infections

5,000 fewer central line-associated bloodstream infections occurred in 2009–2010, saving $83 million in healthcare costs

-32%

Decline in SIR for Central Line-Associated Bloodstream Infections (CLABSI)

Source: National and state healthcare-associated infections standardized infection ratio report - January – December 2010
State legislation requiring public reporting of HAIs

State HAI public reporting
2004 & 2012
Million Hearts

Preventing 1 million heart attacks and strokes in 5 years
Heart disease and stroke are leading killers in the U.S.

- Each year more than 2 million people in the U.S. suffer from heart attacks and strokes.
- Every year 815,000 people die from cardiovascular disease (1 in every 3 deaths).
- These conditions incur $273 billion in direct medical costs and $171 billion in indirect costs every year and account for the largest single portion of racial disparities in life expectancy.
Clinical and public health progress contributed about equally to decreased U.S. heart disease deaths, 1980-2000

Clinical interventions = ~50%

Risk factor reductions = ~50%

<table>
<thead>
<tr>
<th>COMMUNITY PREVENTION</th>
<th>CLINICAL PREVENTION</th>
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</thead>
<tbody>
<tr>
<td>Reduce need for treatment</td>
<td>Improve treatment</td>
</tr>
<tr>
<td>Tobacco control</td>
<td>Focus on ABCS</td>
</tr>
<tr>
<td>Sodium reduction</td>
<td>Health information technology</td>
</tr>
<tr>
<td>Trans fat elimination</td>
<td>Clinical innovations</td>
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</tbody>
</table>
Improved cardiovascular care could save 100,000 lives/year in U.S.

<table>
<thead>
<tr>
<th>Status of the ABCS</th>
<th>People at increased risk of cardiovascular disease who are taking aspirin</th>
<th>47%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong>spirin</td>
<td>People with hypertension who have adequately controlled blood pressure</td>
<td>46%</td>
</tr>
<tr>
<td><strong>B</strong>lood pressure</td>
<td>People with high cholesterol who have adequately controlled hyperlipidemia</td>
<td>33%</td>
</tr>
<tr>
<td><strong>C</strong>holesterol</td>
<td>People trying to quit smoking who get help</td>
<td>23%</td>
</tr>
<tr>
<td><strong>S</strong>moking</td>
<td></td>
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</table>

*MMWR. 2011;60:1248-51.*
Real-time availability of patient data can improve quality of care

- Patient self-management
- Patient/provider communication
- Allows providers/facilities to better track performance, QI targets
- Alerts providers if patients may need more intensive treatment
Reports to physicians on patient panels

Quality Measures

- % A1C Testing: 46% (50% last 6 months)
- % BP Controlled in Hypertensives: 70% (58% last 6 months)
- % Cholesterol Screening among non DM/IVD: 100% (47% last 6 months)
- % BMI Entered: 100% (83% last 6 months)
- % Smoking Status Taken: 62% (61% last 6 months)

Recommendations

Based on this report and the impact of each measure on patient health, 2 measures to target for future improvements are:

- Quality measures: % A1C testing
Improving surveillance
Affordable Care Act funding

• Support for state, local, and tribal public health infrastructure
• Data collection/analysis to measure impact of health reform, support strategic planning
• Facilitated increase in 2011 National Health Interview Survey sample size to enable more precise national as well as state-specific estimates
• Exploring biomarker addition to NHIS
Immunization registry (IIS) status in Meaningful Use (MU) Stage 1

- ARRA and PPHF funds awarded to 34/56 IIS grantees for enhanced IIS-Electronic Health Records interoperability

- As of March 31, 2012
  - 88% (49/56) grantee IISs reported HL7 capability (3 were HL7 ready, but not available for MU testing)
  - 5% (3/56) grantee IISs were in various stages of developing HL7 capability
  - 5% (3/56) grantees did not have an IIS or use State’s IIS
  - 2% (1/56) grantees did not report
Proposed IIS functional standards for 2103-2017

- Will update standards last issued in 2001
  - Identify operational, programmatic & technical capacities all IISs should achieve by end of 2017
  - Support delivery of clinical immunization services at point of administration, regardless of setting
  - Support activities/requirements for publicly-purchased vaccine (including VFC and state purchase programs)
- Maintain data quality, availability & security
- Promote vaccine safety
- Comment period currently in progress
Strengthening support for state, tribal, local, and territorial public health is another key CDC strategic focus area.
Decreasingly relevant
Mission critical

Isolated
Mutually beneficial

Increasing, unsustainable
Efficient use of new technologies

Out-of-date, isolated
Cutting-edge, connected