Preventive Services ToolKit Project

Instructor’s Manual and Supplemental Materials

Module 5—Epidemiology as a Policy Tool

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This module will discuss translation of epidemiologic concepts and use of Epi tools to develop and influence health-related policy. As with the Planning module, the focus will be on the policy and administrative “mindsets” and how best for health professionals to connect with them. As with the Evidence and Planning modules, there are extensive supplemental materials accessible online, appended to the Instructor’s Manual. In the case of the Epi module – these consist of an extensive set of internet “bookmarks” dealing with both Epi concepts and disease-related issues.

Slide 2: Teaching Objectives

- Identify and use patterns of illness, risk and likely response
- Use multiple data models
- Insert science into policy
- Understand time intervals and program life cycles — and use this understanding to help long term survival of programs

Slide 3: Epidemiology

- Using what we know about determinants of wellness, illness, disability and death to improve outcomes
  - Etiology
  - Risk profile
  - Natural history
  - Efficacy of preventive and therapeutic measures
  - Practicability of preventive and therapeutic measures
  - Intended and other consequences — social, cultural, economic and other

Slide 4: Epidemiologic Process

- Determine who is at risk
- Stratify groups by level of risk
- Determine why they are at risk
- Craft interventions to reduce that risk
- Track progress against projections
“Policy” is the translation of ideas into action – deciding what you want to do, and how you want to do it. In this context, it involves the selection of problems to be addressed and the interventions to address them.

“Strategy” is long-term and large-scale policy – like deciding whether or not to have a dedicated diabetes management education program for Hispanic patients in your medical center.

“Tactics” refers to the details of implementing a strategy – like deciding where to locate the new health education program and how to staff it.

“Policy” also involves deciding who pays the costs and who gets the benefits. This aspect of policy looms large in health-related decision-making and often gets in the way of effective and cost-efficient clinical and community preventive services.

- for example – the decision by many public health agencies that they will only provide healthcare to uninsured clients will sharply limit the amount of service they can provide, and will, more than likely drive away some clients for whom this would be the best and most culturally sensitive source of care.

- The decision within many healthcare systems to make available health education to all members as a service any member can access, if desired – is usually implemented in a way that fails to aggressively reach out to those who could most benefit from this service. This, in turn creates a situation in which the service is mainly used by the worried well, who have little to benefit from it, while those most in need of the service never connect with it. (the policy issue here is one of stratification and dedication of the service to those who most need it).

- (tell story of Model Cities Immunization) as an example of an innovative approach to public health policy, using both principles of epidemiology and the Allison model of “mindsets”
Slide 7: Politics

Tell story of Louisiana Community Care as example of politics divorced from science

Re Science and policy – PSA screening in response to mammograms (in name of providing males a similar service)

Slide 9: Inference and Causation

The best example of this are those from the Framingham Studies of heart disease where the defined population was some 40-50,000 adults in the town followed for the last 30-40 years to evaluate the likelihood of heart disease based on such parameters as blood pressure, relative weight, smoking, and more recently lipids and exercise. The recommendation for prevention of heart disease and stroke are remarkably effective interventions following from the study of the population. The major drawback of the study was a lack of participation by enough minorities to determine whether the changes recommended for the basically white population was appropriate for generalizing to the entire US population.

• The relations of the major study parameters to the suspect disease were all biologically plausible. The sequenced of smoking and tobacco use for years before onset of disease the temporally (sequentially) appropriate. The study had sufficient power (a large enough population) to determine relative risk between those with and without the studied attribute. The preventive intervention recommended has been studied sufficiently to receive the gold seal of approval from the US Task Force on Preventive Services.

• Delays between exposure and illness; between delivery of preventive service and reduction of risk.

• Saturation of benefit (when the need for the service in question is so completely met that year to year additional reductions in morbidity and healthcare costs will no longer be expected)

• When looking as inference that leads to defining cause and effect, the incubation periods were appropriate, based on a significant accumulation of basic research about the attributes examined in the Framingham study. The incubation periods for development of stroke and heart disease were sufficiently long that the effect clearly preceded the outcome. Finally, while the penetration of preventive services to combat heart disease and stroke is not 100 %, it has saturated enough centers of
medical care delivery that the incidence of heart disease and stroke have diminished significantly over the past 20 years.

**Slide 10: Direct Benefits of Preventive Services**

We should never forget that the purpose of preventive services is improve health outcomes.

There is no chance of that occurring unless the program succeeds in reaching the potential clients who could benefit from the program. This intermediate outcome variable can be seen as a benefit in itself, even if only for indirect benefits as noted below.

In the case of tertiary care DM programming, another substantial benefit is enhanced patient understanding and adherence to prescribed regimens of treatment. Once educated to this behavior for one diagnosis, the chances are good that the patient will show similarly improved adherence to prescribed regimens for other illnesses – thus conferring a system benefit.

**Slide 11: Indirect Benefits of Preventive Services**

Once patients find that following your advice for one problem works they are much more likely to take your advice on other issues. For example; a patient who improves his or her ability to walk and up and down stairs after following a diet and losing weight is more likely to follow recommendations to stop smoking, drink less alcohol and consider counseling for diabetes management. This is consistent with evidence that once people improve one aspect of their life they are more likely to change other lifestyle behaviors such as wearing seat belts.

- Patients whose health improves are more likely to interact well with staff members, giving them credit for helping with their improved status. They, in turn, will relate better to each other, leading to improved morale in the office/institution.
- The combination of these outcomes is likely to lead to a competitive advantage in the market place.

**Slide 12: Other Consequences of Preventive Services**

Just as pediatricians, due to their successful use of preventive medicine are now besieged by mothers worried about everything they see on TV and in magazines, who bring well children into the office and waste time requesting unnecessary interventions, .. Many patients are already paranoid about disease and one of the problems of providing preventive
services is that some patients will believe that everything is preventable and will call you about everything they read or perceive. If your organization does not believe in prevention and refuse to pay/recognize doctors and nurses for providing the service morale will drop and even clinically successful interventions will be abandoned. Prevention has to become an institutional belief; it has to be pervasive among all the staff, clinical and administrative. Adverse reactions to some medications, even when rare, can lead to fear of similar problems when other secondary or tertiary preventive services are suggested. Finally the institution of preventive services will increase the patient’s length of stay, however the effect this has on the organization depends on how the services if delivered, and by whom.

**Slide 13: Projecting Costs and Benefits – Special Issues**

This slide is intended to focus on the issue costs and benefits from the perspective of multiple different stakeholders – to illustrate both the complexity of the healthcare environment and the need to carefully consider which of the stakeholders has primary say over whether the program or policy you are proposing will be approved.

In the healthcare system – what is a cost to the insurance carrier or payer is revenue for the provider. There have been examples of successful DM programs eliminated by hospitals because they cut too much into their revenues.

The patient’s major interest is quantity and quality of life. Unfortunately, patients have no direct say in health-related policies outside of community health center settings and a scattering of private sector settings. The current fad for consumer-centered health insurance plans appears to be designed more to shift risk from the insurance company to the consumer that it does to give the consumer greater control of his or her healthcare services. That being said, it does appear to be likely to result in more effective delivery of clinical preventive services.

The employer’s concern about absenteeism and on-the-job productivity is not synonymous with the healthcare provider’s interest in reducing healthcare costs. As mentioned before – depression, substance abuse, low back pain and arthritis are all health conditions that cause substantial loss of employee productivity without the promise that more effective treatment would reduce emergency room use or hospitalization. Thus, employers are very interested in these services, but health insurers are not.

**Slide 14: Small-Numbers Epidemiology**

When conducting clinical research, one usually goes through a statistical exercise by which one estimates the sample sizes needed (numbers of cases and numbers of controls) to achieve statistical significance at p<0.05, if results come out as expected. When doing public health programming or disease management in a healthcare setting, one does not have the option of securing larger sample sizes, and, only rarely, does one have the luxury of arranging for a “control” group.

As a matter of fact, even before and after differences, beyond
the initial implementation of a public health or clinical preventive service are almost impossible to achieve in practice because the differences tend to be relatively modest (like a 10% reduction in infant mortality following an aggressive MCH program) and the numbers of cases small.

How does one then proceed to set up a data system to track whether or not the program is working as intended??

The usual advice is to aggregate data over a three to five year period to get larger numbers – but, in practice, with annual budgets and reports, this tends not to be satisfying.

While aggregating the data for statistical significance tends not to be satisfying, aggregating the data to smooth the trend line does tend to helpful in providing convincing evidence of program effectiveness. In practice, simple visual presentation of trend lines (smoothed or not) and comparison of each year’s data compared to the immediate pre-implementation indices seem to work best.

While in common use in social service programs, use of p< 0.2 (an 80% chance that the result was not due to random variation) can enable use of statistical and software tools for illustrating program progress or the lack thereof.

**Slide 15: Syndemics**

*(suggested approach is to go through the contents of the slide twice – once a simple read, the second consisting of verbal presentation of the material below)*

- Syndemics provides an approach to consideration of linked sets of health problems involving the defined population, the new epidemics of chronic disease, that are multi-factorial and affect more than one organ system.

- Syndemics is defined as two or more afflictions, interacting synergistically, contributing to excess burden of disease in a population.

- A syndemic orientation is primarily distinguished from other perspectives by its explicit emphasis on examining connections between health-related problems. With this concern, it offers a broader framework for understanding how multiple health problems interact in particular communities. A syndemic orientation elevates public health inquiry beyond its many individual categories to examine directly the conditions that create and sustain overall community health.

- Further the medical model of disease specialization, once praised for its utility and versatility, is proving inadequate for confronting such contemporary public health challenges as eliminating health disparities where chronic disease adversely affect certain defined populations when compared with those on whom most research has been performed, white males have remarkably different risks and outcomes..

- Although conventional prevention programs have had strong effects, for the most part the categorical approach has failed to assure the conditions for overall community health, and it has done little to spread successes equitably among subgroups in society.

- Related concepts include: linked epidemics, interacting epidemics, connected epidemics, co-occurring epidemics, co-morbidities, and clusters of health-related crises.
In addition to considering single risk factors that impact the incidence of multiple diseases, it also considers how the burden imposed by one disease complicates the management of the others. A syndemic approach facilitates the search for interventions that can simultaneously address multiple linked health problems in a manner acceptable to the host community and in a way that will not make any of the problems worse.

The tools of syndemics include the basic tools and concepts of epidemiology and biostatistics, plus two types of tools not commonly used by epidemiologists and healthcare policy makers.

- System dynamics tools look at the ecosystem in which the illness occurs and provide both qualitative and quantitative analysis of how multiple variables interact with each other.
- Navigational software can be used to estimate the directionality (getting better or worse) and strength of proposed alterations of the ecosystem.

Domains addressed include all four community environments (social, physical, biologic, and administrative/political plus common etiologic factors and how each illness impacts each of the others.

**Slide 16: Data Models**

To most effectively address opportunities for improving health status and reducing healthcare costs, one must be able to address health-related issues from at least three different perspectives – medical, public health, and community/mental health/behavioral. These will be explored, one at a time, in the next three slides.

There are many ways to lump and divide concepts and paradigms for exploring root causes of illness in the community.

**Slide 17: Medical Data Model**

The medical paradigm sees health issues in terms of diagnosis and procedure. While this is appropriate when the mission is one of treating illness – it simply does not meet our needs for planning and evaluating preventive services.

An example of the medical data paradigm is shown in this slide – as the five leading causes of death in the year 2000 tabulates the data according to major risk factor or etiologic agent. According to these data, about 35% of all deaths are due to the two top-ranked risk factors – tobacco and “poor diet and physical inactivity.”

**Slide 19: Community Data Models**

The third of the three paradigms consists of the factors most likely to be most visible to people in the community, especially within socially and economically disadvantaged communities. If health professionals are to partner with community stakeholders – as proposed in the COPC module, it is critically important that the health professionals develop an understanding of these issues and...
When considering Return on Investment (both health-related and fiscal) for a new or expanded preventive service – at least five different delays (each measured in months) must be considered:

- Conception of proposal to approval – this will vary by healthcare entity and by type of service. Adding an adult immunization or a pap smear does not require the cost and time for preparation and training that a colonoscopy or behavioral intervention does.

- Approval to implementation – may have to await start of a new fiscal year unless external funding secured unless the new service can be easily integrated into an ongoing procedure that fits into a reimbursable DRG.

- Once approved – there are two major options – “build” the program internally by hiring and training your own staff, or “buy” the service – pre—packaged from an outside vendor. Buying the service from an outside vendor will usually speed program implementation, but increase (often double) the cost, and may, depending on the vendor, limit your ability to extend similar preventive services to other patients with other diseases.

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**Slide 21: Final Comments**

As with the Evidence and Planning modules, there is a package of supplemental material pertinent to this module, available online at [www.aaphp.org](http://www.aaphp.org), with no registration or membership required. It is appended to the Instructor’s manual, and, in the case of the Epi module, it consists of hotlinks to a wide array of resources.
of internet resources dealing with Epi methodology, specific diseases and selected management and policy concerns.
Supplementary Materials

Surveillance Bookmarks

Epidemiology Super-course (U. Pitt)
http://www.pitt.edu/%7Esuper1/

CancerBACKUP Active surveillance (active monitoring)
http://www.cancerbacup.org.uk/Cancertype/Prostate/Treatment/Activesurveillance

CDC Division of Public Health Surveillance and Informatics
http://www.cdc.gov/epo/dphsi/casedef/

European Influenza Surveillance Scheme
http://www.cdc.gov/epo/dphsi/casedef/

FoodNet (CDC) - Diseases & Pathogens Under Surveillance
http://www.cdc.gov/epo/dphsi/casedef/

NHS – Surveillance Data
http://www.show.scot.nhs.uk/scieh/surveillance.html

Influenza Surveillance – Canada Definitions for the 2004-2005 season
http://www.phac-aspc.gc.ca/fluwatch/04-05/def04-05_e.html

Johns Hopkins Hospital System – Surveillance
http://hopkins-heic.org/surveillance/

Update on Vaccine Safety Issues.
http://www.phac-aspc.gc.ca/publicat/pch/vol3supb/pche_i.html

CDC - Pediatric & Pregnancy Nutrition Surveillance System
http://www.cdc.gov/pednss/

Monitoring and Surveillance for Livestock and Poultry Diseases
http://www.aphis.usda.gov/vs/nahps/surveillance/

US-AID - Faculty Based Surveillance

Cardiovascular Disease Bookmarks

Prevention and Cardiovascular Disease (AHA)
http://www.americanheart.org/presenter.jhtml?identifier=1247

Cochrane Library
http://www.cochrane.org/reviews/en/ab000362.html

Facilitating Prevention in Primary Care

Screening for Diseases: Prevention in Primary Care (ACP) http://www.rsmpress.co.uk/bksnow.htm


Framingham &amp; Epidemiology
http://www.hhmi.org/biointeractive/museum/exhibit98/content/e2info.html

Coronary Risk Profile - Health Risk Appraisal
http://www.americanheart.org/presenter.jhtml?identifier=4528

Risk 333 Stratification and Epidemiology of Sudden Death
http://www.biomedcentral.com/1523-3782/6/

Epidemiology and prognosis of coronary heart disease

Barriers to Prevention and to Cardiovascular Health

Barriers to Dietary Control (JAMA)
October 10, 2006  PSTK Instructors Manual and Supplemental Materials - Module 5 Epidemiology as a Policy Tool

Barriers to Prevention
http://www.merck.com/mmhe/sec01/ch005/ch005d.html
Barriers to Cardiovascular Health

**Medicare Benefits**

Medicare Prevention Benefits
Contribution of Lifestyle-Related Factors to Preventable Death
http://www.iom.edu/CMS/3793/24066.aspx

**Definitions**

http://www.pitt.edu/%7Esuper1/ U.Pittsburgh -Epidemiology Page
Epidemiology- Definitions http://www.google.com/search?q=define:epidemiology
The WWW Virtual Library http://www.vlib.org/
Medicine and Health Epidemiology http://vlib.org/Medicine
Glossary of Clinical Epidemiology http://www.med.ualberta.ca/ebm/define.htm

**Public Health Model of Prevention**

Primary Prevention in the Adult (AHA)
http://www.americanheart.org/presenter.jhtml?identifier=4704
Secondary Prevention(AAFP)
http://www.aafp.org/afp/20050615/2289.html
Tertiary Prevention(Diabetes - see fourth paragraph)
http://www.healthierus.gov/steps/summit/prevportfolio/strategies/reducing/diabetes/prevention.htm#levels

**Gordon’s Continuum of Care Model**

Gordon’s Continuum of Care
http://www.mentalhealth.samhsa.gov/publications/allpubs/SMA00-3437/SMA00-3437ch3.asp

**Syndemics**

Syndemics
http://www.cdc.gov/syndemics/
Syndemics - Definition http://www.cdc.gov/syndemics/overview-definition.htm
Syndemics – Uses http://www.cdc.gov/syndemics/overview-definition.htm
Syndemics - Planning & Evaluation
http://www.cdc.gov/syndemics/overview-planeval.htm

**Qualitative Epidemiology**

Institute for Qualitative Epidemiology
http://www.uofaweb.ualberta.ca/iiqm/nav03.cfm?nav03=35213&nav02=33481&nav01=30519
Environmental Scanning

An Environmental Scan
http://www.ocl.org/membership/escan/default.htm
Environmental Scanning  http://www.horizon.unc.edu/courses/papers/enviroscan/
Political, economic, social, and technological impact on the CNIB.
http://www.cnib.ca/strategicplan/scan.htm