# THE APPLICATION OF INFORMATION SYSTEMS IN PUBLIC HEALTH MANAGEMENT --- AN APPLICATION TO TRACK POLICY, REGULATORY, AND LEGISLATIVE (PRL) INITIATIVES

*Emily Wong, VA Palo Alto Health Care System, 795 Willow Rd, Menlo Park, CA 94025,*
*Emily.Wong@va.gov*

## ABSTRACT

Policy, regulatory, and legislative (PRL) initiatives are vital for public health organizations. At the most basic level, changes in PRL must be monitored in order to comply with the law. Proactively monitoring PRL helps to identify trends in order to formulate positions and provide feedback to decision-makers. The identification of gaps or problems in areas of policy is facilitated by accurate tracking and is an effective way to strengthen the public health framework. The author presents here a case study in which the manual process of monitoring PRLs is automated into a simple and effective database application.

## BACKGROUND

With the passage of the Patient Protection and Affordable Care Act, health care policy has emerged at the forefront of public health discussion. However, the importance of health policy has never been disputed: in 1988, the Institute of Medicine (IOM) published their landmark assessment, *The Future of Public Health* [1]. The report found that public health was in disorder, suffering from chronic underfunding, fragmented efforts, a lack of trained resources, outdated technology, confusing legal authority, disjointed policy development, and lack of accountability. In short, public health infrastructure was weak and ineffective. The report identified three core functions of public health: *assessment*, *policy development*, and *assurance*. In 1994, expanding on these core functions, the Public Health Functions Steering Committee provided more concrete goals for public health. Their report listed ten essential services, and these services are activities that describe how to achieve the three core functions of public health [2]. These services are:

1. Monitor health status to identify community problems
2. Diagnose and investigate health problems and health hazards in the community
3. Inform, educate, and empower people about health issues
4. Mobilize community partnerships and action to identify and solve health problems
5. Develop policies and plans that support individual and community health efforts
6. Enforce laws and regulations that protect health and ensure safety
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable
8. Assure a competent public and personal health care workforce
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services
10. Research for new insights and innovative solutions to health problems

Developing and monitoring policies and enforcing laws and regulations are two of these ten essential services. In this paper, the author demonstrates how a simple database application can help a health department maintain and track policy, regulatory, and legislative initiatives.

**CASE STUDY BACKGROUND**

The public health department in this case study is the second largest municipal health system in the country, with a yearly budget exceeding USD $720 million in 2014. It is also the most populous county in the U.S., and serves over 10 million residents. Within the department, the Communicable Disease Control and Prevention division (CDCP) runs six programs: Acute Communicable Disease Control (ACDC), Immunization Program (IP), Public Health Lab (PHL), Tuberculosis Control (TBC), Veterinary Public Health (Vet PH), and Viral Hepatitis. Each program has a director, and each monitors their own issues. For example, the Viral Hepatitis Program was interested in increasing access to Hepatitis B and Hepatitis C drugs. Sovaldi, a drug that cures HCV, went on the market in 2014 [3]; costing $84,000 per treatment cycle, it was only being covered by insurance for their sickest patients. The Viral Hepatitis Program was attempting to create legislation in California that allowed women of childbirth years, a high-risk and particularly vulnerable population, to access Sovaldi [4]. Meanwhile, Tuberculosis Control was working on implementing Video Directly Observed Therapy (VDOT) to increase drug compliance rates in TB patients, and dealing with the challenges of safeguarding protected health information (PHI) while storing the videos in the cloud. Acute Communicable Disease Control wanted policy developed to require the reporting of emerging infectious diseases, and also require health care associated infection (HAI) data collected by the CDC to be given to relevant local health departments. At the time, there was tension with various stakeholders regarding legislative language.

There were also local issues that affected CDCP programs; for instance, the Public Health Lab was trying to move from traditional culture methods to rapid nucleic acid testing. They were also interested in being able to release patient information directly to patients, as well as changing and re-defining timelines for reporting lab results. The Immunization Program was attempting to put forth a local mandate to require children to be vaccinated for influenza before admission to daycare or preschool. The Immunization Program wanted to make changes to the immunization exemption process in the county, and felt that it was important to pursue a mandate to order pharmacists administering vaccinations to enter the data into a state immunization registry. Finally, Veterinary Public Health was concerned with increases in urban agriculture and the enforcement of cottage food laws, prohibiting various foods from being produced in one's home. These are only examples but represent the range of issues that concerned each program within CDCP's jurisdiction.

Policymaking is a notoriously long process, with long periods of waiting and sudden bursts of action. In efforts to facilitate CDCP's work in policy, regulation, and legislation, the author conducted comparative research, analyzing how other local health departments addressed similar issues, or if precedents existed that CDCP could or should not imitate. In conducting research for each CDCP program, the author first had to conduct a deep comprehensive search for issues that were important to each program area. The author also wrote preliminary reports for each of the six programs, and presented them at the introductory meetings between the directors and the Senior Policy Officer. The directors and their representatives identified topics that they were interested in pursuing.

After identifying the statuses of recent legislation (within the last 5 years), as well as legislation currently under deliberation, each issue had to be documented. Previous staff members had created a physical filing system to track issues, using binders to keep track of correspondence, printouts, and other pertinent information. An Excel spreadsheet was used to list all completed, active, and future policy issues. This manual process was a little inefficient, because the binders were extremely cumbersome and difficult to navigate, and needing to print hard copies for numerous and lengthy documents was unproductive. It was also difficult to demonstrate to others what kinds of issues were being tracked. The author therefore decided to create a Microsoft Access application to automate the tracking process,

which could be stored on CDCP's shared network drive and easily accessed by the appropriate individuals.

## PRL TRACKING SYSTEM DEVELOPMENT

With the basic understanding of how the department worked, the author went through the manual process of tracking PRL using the file binders and the excel spreadsheet. The exercise enabled the author to understand the data, information, and business requirements.

**Data Modeling**

The PRL database application essentially contains eight entities: *Category, PRL, Status, Target, Partner, Contact, PRL_Method, and ActionPlan*. *Category* is the table that tracks the program being monitored. The six programs are: Acute Communicable Disease Control (ACDC), Immunization Program (IP), Public Health Lab (PHL), Tuberculosis Control (TBC), Veterinary Public Health (Vet PH), and Viral Hepatitis. *PRL* is the master table that contains information regarding the policy, regulation, and legislative initiatives that each program is tracking. To track a PRL, it needs to know its current status and contact information for the PRL. Each PRL is associated with a method, i.e. how the PRL will be executed. For instance, there are currently seven methods that interest the department: Education, Health Officer Order, Legislation, Local Ordinance, Organizational Policy, Recommendation, Regulation, and Other. It is necessary to know the partners and targets of the PRLs, because clearly delineating stakeholders in the policymaking process facilitates the development of the policy and its successful passage. More importantly, each PRL has an Action Plan to track and follow. Based on their relationship, the author designed an entity relationship data model as shown in Figure 1. Note that the entities show only the salient attributes for brevity.
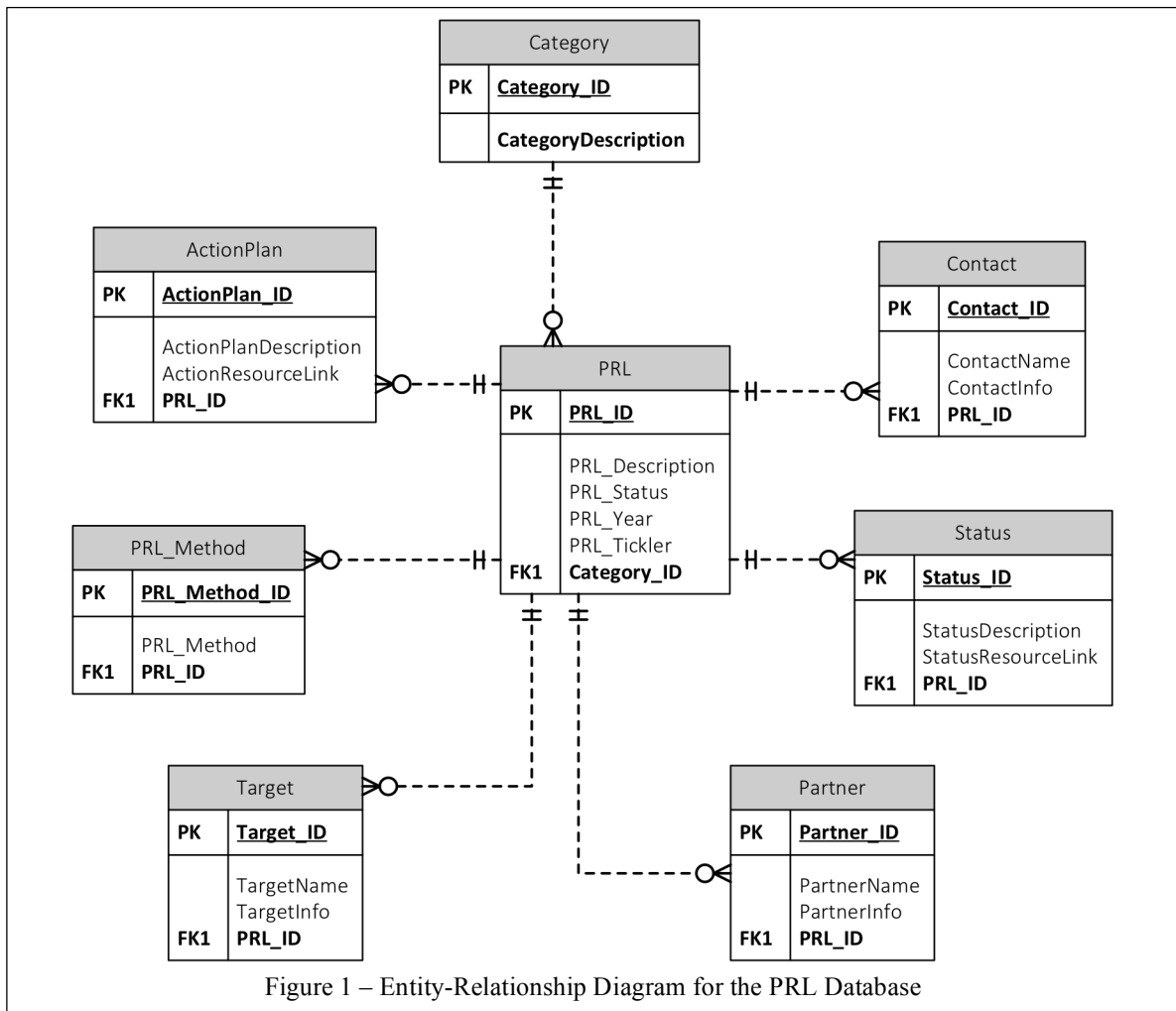


Figure 1 – Entity-Relationship Diagram for the PRL Database

It is worth mentioning a few interesting design decisions in the data model. The Action Plan contains past, current, and future action plans of the PRL in question, which can be easily tracked in a database. Often, the information may be pointing to an external reference, such as a webpage, shared document, or folder in the network drive. The attribute ActionResourceLink in ActionPlan is a hyperlink that points to these external resources. Similarly, StatusResourceLink in Status is also a hyperlink to an external resource.

**Implementation in MS Access**
The data model was then implemented in Microsoft Access 2010. After thorough testing and comments by other stakeholders in CDCP, the password-protected application was compiled and deployed in the department's shared drive accessible to authorized personnel. The following screenshots demonstrate how the application works.

The main data entry form is a master-detail-detail form, in which the master form based on table PRL contains many subforms that are accessible from the tabs of the subform. In the example, a new PRL has been created for the ACDC program regarding oversight of ambulatory care settings (ACS). In addition to the status, year, and tickler (reminder) date, the first tab of the subform shows the contacts, the partners working with CDCP on this initiative, as well as the target population of the initiatives. Using this subform, information and updates can be disseminated to the targets in a timely manner. See details in Figure 2. The Target tab indicates the group that the PRL is targeting; in Figure 2, the ambulatory care setting policy is directed towards pain clinics, outpatient centers, senior community centers, etc. The Method tab in Figure 3 shows the method, i.e. through what channel will the topic be completed. For example, ambulatory care settings must be regulated on a state level, so the method would be Legislative. Improving urban agriculture and compliance with cottage food laws may simply be a matter of educating vendors, so the method would be Education. The Notes tab in Figure 4 shows notes regarding the status. A note has two major components: the narrative of the note, and a resource link that connects to an external resource such as a webpage or a shared folder/document in a network drive. Each status may have multiple notes. Finally, the Action Plan tab in Figure 5 documents the plan of action and external resources related to the action plan. It is possible for a PRL to have more than one action plan.
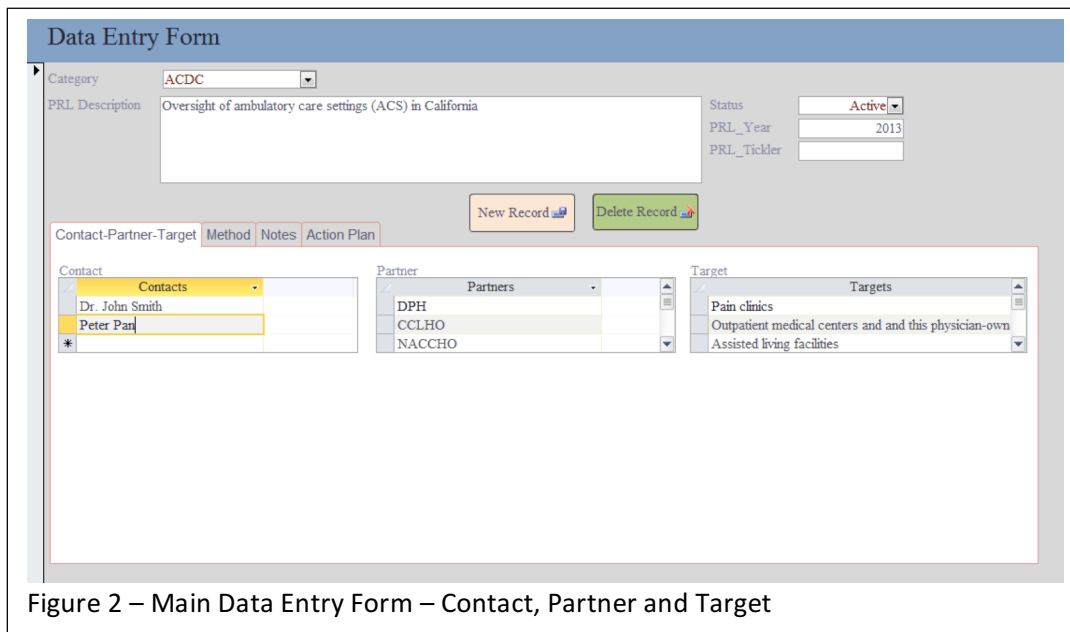


Figure 2 – Main Data Entry Form – Contact, Partner and Target

Figure 3 – Main Data Entry Form - Method



Figure 4 – Main Data Entry Form – Notes for Status

The application further allows a user to search for a PRL and to create reports with a report filter to choose specific search criteria.

## CONCLUDING REMARKS

While schools of public health have relied on accreditation as a measurement of their teaching and research quality, it is only recently that state, tribal, and local health departments have had the option of accrediting their departments. The IOM's seminal 1988 work explicated the core functions of public health, and "10 Essential Services of Public Health" proposed by the Public Health Functions Steering Committee became a cornerstone of public health practice. Accordingly, in its 2004 Futures Initiative, the CDC identified accreditation of health departments as an important step in improving the quality and strength of health infrastructure. In September 2011, the Public Health Accreditation Board (PHAB), the national public health accreditation organization, formally launched a national voluntary public health accreditation program. The accreditation process allows the PHAB to measure the performance of a health department using a defined set of standards to achieve the goals of improved quality, accountability, and credibility of the public health practice. Since the launch of the national accreditation program in 2011, 79 governmental public health departments have been accredited by PHAB. PHAB defines 12 domains of measuring performance for accreditation purposes. The latest Standards and Measures Version 1.5 can be found in [5]. Among the 12 domains, Domains 5 and 6 are related to policy and the enforcement of public health laws and regulations, and each domain has a set of standards that need to be supported by detailed documentation. The need for documentation and periodic reporting and maintenance of current policies is best served by the creation of a database.

In this paper, the author illustrated how manual tracking of PRL is easily automated with a database application. The current PRL application has the essential capability of documenting and tracking health policy initiatives. While the current PRL was not developed specifically for accreditation purposes, the application can be easily extended to streamline the accreditation process, especially for Domains 5 and 6 of the PHAB's national accreditation guidelines. In their 2013-2017 Strategic Plan, the health department in this case study announced their intention to ensure readiness for and obtain national accreditation. It is very possible that other applications similar to the PRL application may be developed to make the accreditation process more manageable.

## REFERENCES

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