

Grant Application

Assess the need for medical staff to administer Tdap vaccine (Tetanus, Diphtheria, Acellular Pertussis booster) to the academic community at local universities. This project would be designed in three phases.

1. Phase 1 will involve assessing the number of College/University faculty without current active pertussis immunization status via a survey. This survey would assist in quantifying the knowledge and acceptance of faculty concerning the Tdap vaccine, evaluating the staffing requirements to vaccinate the faculty cohort, and determining the potential costs to implement the plan.
2. Phase 2 will be administering the Tdap vaccine to the academic faculty. This Phase involves securing staff required to conduct the vaccination program, identifying funding sources, and planning a proposed implementation schedule.

Phase 3 will expand the project (Phases 1 and 2) to the other Universities and Colleges in the Western Pennsylvania area.

Purpose and Objective:

According to the Morbidity and Mortality Weekly Report (MMWR 61(4) of February 3, 2012) only 8.2% of adults 19-64 years of age have been vaccinated with the Tdap vaccine. Since Tdap was licensed by the CDC in 2005 as a single-dose booster for persons 11-64 years of age (Gall, 2011), this is not a very impressive record of acceptance of the vaccine.

The CDC's Pink Book

(<http://www.cdc.gov/vaccines/pubs/pinkbook/pert.html#pathogenesis>) states that adolescents and adults are the primary carriers of the B. pertussis pathogen and are often the source of infection for infants. Pertussis is highly communicable with an incubation period of approximately 7-10 days (with a range of 4-21 days).

The Pink Book also states that “the most common complication, and the cause of most pertussis-related deaths, is secondary bacterial pneumonia. Young infants are at highest risk for acquiring pertussis-associated complications. Data from 1997-2000 indicate that pneumonia occurred in 5.2% of all reported pertussis cases, and among 11.8% of infants younger than 6 months of age”

Therefore, one of the best methods for prevention of pertussis in infants would be to increase vaccination rates in adolescents and adults, thereby minimizing the pathogen as a source of infection.

There are a number of approaches to increase the rate of adolescent and adult vaccination for the Tdap vaccine. A first approach is Maternal Immunization. According to Gall (2011) the American College of Obstetricians and Gynecologists (ACOG) has recommended Tdap for use before conception, during the second or third trimester, or postpartum.

But this approach does not address vaccinating siblings, spouses, grandparents and other caregivers. Gall (2011) describes vaccinating this cohort as a “logistical and financing nightmare (e.g. determining who is responsible for rounding up all the caregivers and paying for their vaccines”).

Bamburgher and Srugo (2008) described the “Cocoon Strategy” – the vaccination of household members, including parents and siblings of newborn infants. As of 2010 the cocoon strategy has not been introduced in any country, mostly due to lack of funding and a difficulty in vaccinating all infant contacts. (Guiso, Liese and Plotkin, 2011). Guiso et al (2011) also noted that targeted application of the cocoon strategy may be feasible in some cohorts – specifically to cohorts who receive private healthcare, military personnel, etc.

The purpose of this project is to implement the Cocoon Strategy among a select group of adults – College and University Faculty Members. This group has the potential to be either parents, or grandparents, and potential caregivers of infants in their extended families. This project would require extensive nurse staffing to reach out and immunize the faculty members in their place of work or in the community.

By immunizing the professional academic staff at a local university, health care providers will ultimately be able to protect the youngest population in our society (infants) who are most at risk from pertussis.

According to the 2011 Pennsylvania Health Profile there were 1,496 cases of pertussis reported for the year – an Incidence Rate of 4.0 per 100,000 residents. This compares to 27,550 reported cases in the United States in 2010 as reported in MMWR 27(53) on June 1, 2012. Bamberger & Srugo (2008) reported that in recent years the incidence of pertussis in the adult and adolescent population has dramatically increased, while pertussis incidence has remained stable in children of less than 1 year of age. CDC data from 2004 reveal the incidence in adolescents (10-19 years of age) has increased 19-times and the incidence in adults (over 20 years of age) has increased by 16 times (Edwards & Freeman, 2006).

The Tot Trax Program in Pennsylvania provides the birth-dose of Hepatitis B vaccine to all newborns and the Tdap (since 2007) vaccine to immunize new mothers who have not yet been immunized. However, the program does not cover spouses, siblings, grandparents, or caregivers of the newborn infant.

All of the data indicates that if the percentage of adults immunized with Tdap vaccine increases, the incidence of disease in the population in general, and the infant cohort in particular, should decline.

Significance:

Implementation of the “cocoon strategy” has been a challenge on many levels. Munoz and Englund (2011) have noted that cocooning has had many barriers since its proposal. The barriers include cost, insurance coverage, problems with reimbursement, vaccine acceptance by the population at risk, and lack of education among providers (physicians and nurses) as well as the parents and grandparents. Munoz and Englund also note that cocooning does not always directly benefit the infant – postulating that maternal immunization might be more effective by reducing disease incidence for the mother as well as passing antibodies directly to the infant.

With this in mind, the Global Pertussis Initiative (Guiso, Liese and Plotkin, 2011) still believes that cocooning “may be feasible” in certain circumstances.

It is possible that the proposed survey and subsequent vaccination program could result in the education of a significant cohort in the population – academic faculty in institutions of higher learning. With approachable and easy-to-understand educational information available to these faculty members, they will be empowered to be able to more effectively inform a key cohort of

interest – late adolescents and early adults. This is the population group most likely to have young, at-risk children in their homes that is most susceptible to pertussis

Impact:

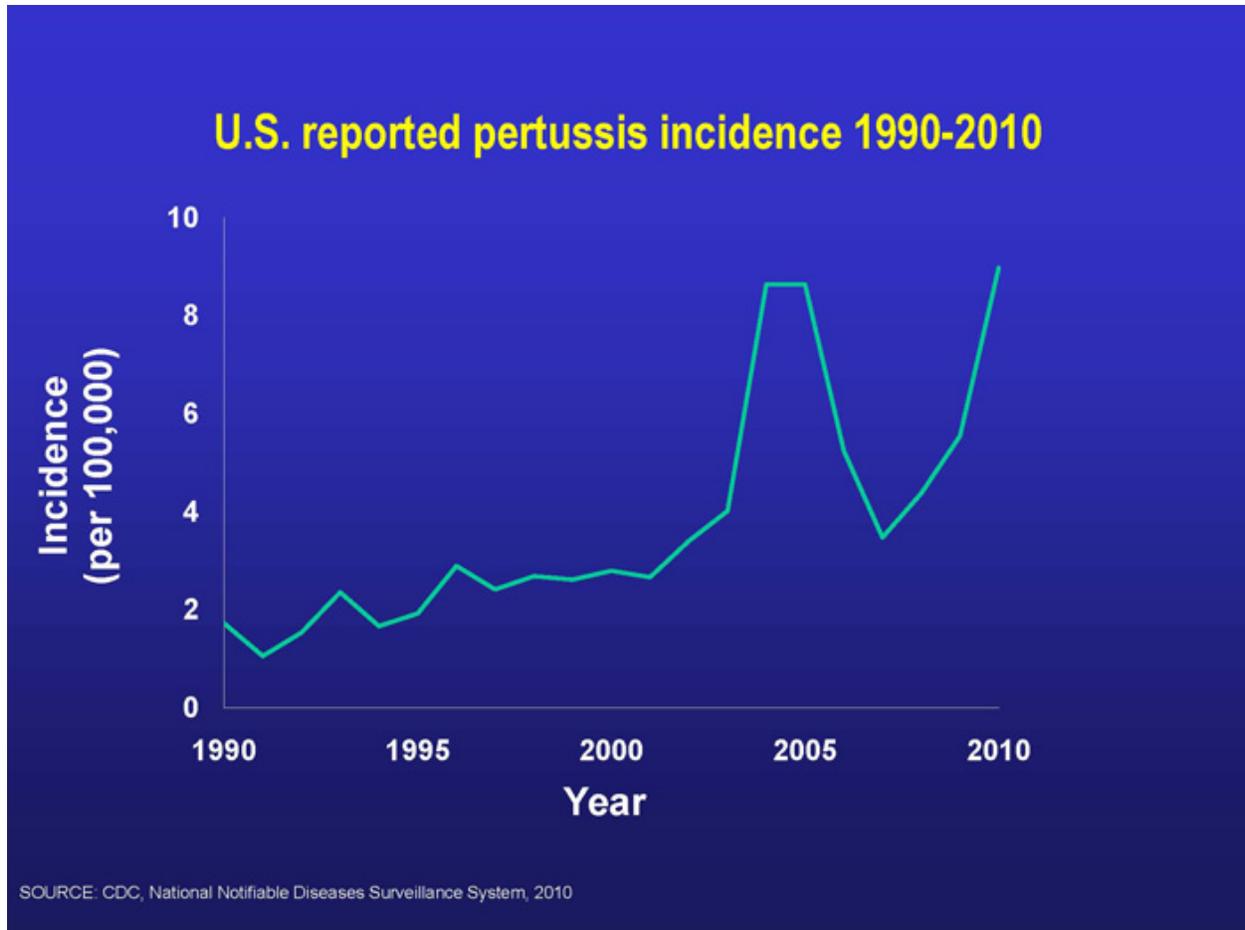
Research in recent years has shown that pertussis has a significant incidence rate in the adult and adolescent population. Davis (2005) indicated that 38% of all cases are reported in the 10-19 year-old age group. Rendi-Wagner et al. (2007) indicated 69% of all cases in Austria were 16 years of age or older! Mancuso et al. (2007) in a U.S. military community reported that 24% of pertussis cases were found in adults over 20 years old. In Yavapai County, Arizona the CDC (2004) reported that 40% (82 out of 485 cases) were family members of infants. Finally, Forsyth and colleagues (2004) reported in the Global Pertussis Initiative report that adults and adolescents are regularly infected with pertussis, thus being a major source of infection in infants.

Additionally, the incidence of pertussis has been rising for a number of years. California experienced 9146 cases, resulting in 10 infant deaths in 2010 – the most cases in 63 years. This was followed by 2,734 reported California cases in 2011 up to November of that year (California Department of Public Health, 2011).

On May 8, 2011 the Allegheny County Health Department (including Pittsburgh) reported that there have been 46 confirmed or probable cases of pertussis identified since the beginning of 2012.

Finally, the CDC, in (MMWR 59(53), reported 27,550 cases of pertussis in 2010.

Compare this with the graph below – showing the reported pertussis incidence from 1990 – 2010. The data show a dramatic increase of cases, despite introduction of new vaccines and the public health efforts to vaccinate the infant/child/adolescent cohort of the population.



Retrieved on June 7, 2012 from: <http://www.cdc.gov/pertussis/surv-reporting.html>

Background/Literature Survey:

The Global Pertussis Initiative was founded to “raise awareness about pertussis and to recommend effective vaccination strategies for disease control” (Guiso, Liese and Plotkin, 2011).

Although pertussis is often considered a disease of children, the CDC Pink Book reports that approximately 60% of all reported cases in 2004 and 2005 were found in patients 11 years of age and older. Guiso and Associates (2011) further report that one of the main factors in increasing incidence of pertussis is a decline in both natural immunity and vaccine effectiveness over time. Therefore, the “cocoon strategy” was designed to increase herd immunity, thereby reducing the risk of transmission to infants. This would be done by providing booster pertussis immunizations to the adolescent population and by vaccinating those adults who are most commonly in close contact with those at-risk infants.

Methods:

The researchers are proposing a short survey to all faculty members at a local University using Survey Monkey. The proposed questions, as currently defined, are included in Appendix A. The purpose of the survey will be to identify demographic information and identify the knowledge and acceptance of this group for the need for pertussis booster vaccination. The survey may be modified prior to commencement of the project.

The sample population consists of all faculty members – full-time and adjunct – who are currently employed by the University. Since all members of the intended sample population are current employees and are located at one of the University campuses, they all have e-mail access. After surveys have been distributed weekly e-mail reminders will be sent for one month, at which time investigators will begin evaluation of the surveys received. It is hoped that the surveys will result in at least a 50% response rate.

Collection of the raw data will be completed within six months of the start of the project. Data will be analyzed and plans will be prepared for the beginning of Phase 2 within the next six months.

Assumptions and Limitations:

The targeted University is an academic institution with a large number of full- and part-time faculty members. All of them are expected to regularly check their e-mail accounts for information relative to the University and their individual Departments. Most of them are assumed to be conscientious in checking e-mail. Some of them will not – the percentage of non-responders is unknown at this time.

It will be necessary to assume that supervisors have informed all faculty members about the purpose of the survey and to encourage all to respond in a timely manner. The researchers would start the project by sending out educational information to all supervisors about the need for pertussis vaccination and encouraging them to forward it to their full- and part-time faculty.

If the responses to the initial surveys are low, the researchers may need to enlist the aid of Department Chairs and those in other leadership positions to further encourage all faculty members to participate.

The investigators shall make every effort to reassure the study population that the information that they share as part of this study shall remain anonymous and will be used solely to increase the rate of vaccination of adults in the University population. Therefore the researchers shall assume that the faculty members will feel free to provide honest answers to the survey questions.

Appendix A – Proposed Survey Questions

Thank you for taking time to complete this survey. Please answer the following questions and return it as soon as possible. If you have any questions, please contact – name, e-mail and phone number here.

1. Please indicate your age:
 - a. 18-25
 - b. 24-29
 - c. 30-35
 - d. 36-41
 - e. 42-47
 - f. 48-55
 - g. 55 and older
2. Please indicate your gender:
 - a. Male
 - b. Female
3. What is your position with the University?
 - a. Assistant Professor
 - b. Associate Professor
 - c. Professor
 - d. Adjunct Faculty
 - e. If other, please enter position here: _____
4. What is your school of employment?
 - a. This list will be finalized once the University has been identified and has agreed to participate
5. What is whooping cough?
 - a. Will formulate a list of 4-5 possible answers
6. What is pertussis:
 - a. Will formulate a list of 4-5 possible answers
7. Is there an adult vaccine for pertussis ?
 - a. Yes
 - b. No
8. Is there an adult vaccine for whooping cough?
 - a. Yes
 - b. No
9. Date of your last tetanus booster shot?
 - a. Last 12 months
 - b. 2-5 years ago
 - c. 5-10 years ago

10. Do not knowAre you aware of the Tdap vaccine?
 - a. Yes
 - b. No
11. If you answered yes to question #10, what is the Tdap vaccine?
 - a. Will formulate a list of 4-5 possible answers
12. Who should receive the Tdap vaccination?
 - a. Will formulate a list of 4-5 possible answers
13. Have you received the Tdap vaccine?
 - a. Yes
 - b. No
14. When did you receive the Tdap vaccine?
 - a. 2012
 - b. 2011
 - c. 2010
 - d. 2009
 - e. 2008
15. What campus do you normally visit?
 - a. Will formulate a list of possible answers once the participating University has been identified
16. When are you normally on campus?
 - a. Mornings
 - b. Afternoons
 - c. Evenings
 - d. All day
 - e. Never – I conduct on-line classes

The researchers have not yet finalized this questionnaire. If faculty teach primarily on-line, or from remote campuses and do not have e-mail access, the researchers will need to accommodate reaching out to them in some other way. This needs some extensive discussion before the questionnaire is “ready to go”!.

Appendix B – Bibliography

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Appendix C – Detailed Budget

Phase 1

1. Preparation of Survey on Survey Monkey	\$ 200.00
2. Researchers time 2 x \$900.00	\$ 1,800.00
3. Compilation and analysis of survey results	\$ 500.00
4. Presentation of results	\$ 400.00
5. Total Requested	\$ 3,000.00

Phase 2

1. Will be developed after the completion of the survey and analysis of the results.