

## Re-Emerging Infectious Diseases: Need for Improving Uptake of Existing Vaccines

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The OMICS Group successfully conducted the 2<sup>nd</sup> International Conference on Vaccines and Vaccination in Chicago, USA in August 2012. Invited speakers outlined fascinating research on vaccines against viruses like Dengue, West Nile and other flaviviruses, Ebola, Marburg and other filoviruses, bacterial infections like TB, anthrax, leptospira, shigella, and meningococcus, as well as parasitic diseases like leishmania, filaria, schistosoma and malaria. There were also presentations on the remarkable progress made towards vaccines against lung, breast, ovarian and other cancers.

There is an understandable interest in vaccines against very dangerous diseases like Ebola virus infection [1] and anthrax [2] and other potential agents of bioterrorism. In addition, the ongoing outbreak of West Nile virus in the United States [3] draws attention to the need for vaccines against these diseases.

Diseases with dramatic names, and viruses made famous by Hollywood blockbusters conjuring up images of heroes in masks and other protective gear, saving millions from the brink of disaster, tend to overshadow the on-going epidemics of pertussis and measles in the USA. These pathogens against which there are well established and effective vaccines are re-emerging with dramatic effects as communities and even physicians are lowering their guard.

Vaccination with a single dose of Tdap and two doses of the measles, mumps and rubella (MMR) vaccine is the best way to protect individuals against pertussis and measles respectively. Vaccination in adults also helps to prevent spread of these infections to infants who are too young to receive these vaccines.

Measles transmission was considered “effectively eliminated” in the United States and Canada by 1998 [4] by the routine use of 2-dose vaccination. Post-elimination surveillance was elegantly reviewed by Fiebelkorn Parker and colleagues [5].

However, in their Morbidity and Mortality Weekly Report dated April 8<sup>th</sup> 2011, [6] the Centers for Disease Control and Prevention (CDC) reported twenty nine cases of measles in the first two months of the year 2011, of which twenty-eight were considered “import-associated” (cases of patients returning from travel abroad and their contacts who developed measles). While the initial cases reported were aged 6-23 months, subsequent reports included cases in older populations. The state of Massachusetts reported measles cases in patients aged 11 months to 84 years [7]. In response to this outbreak, the department of public health published recommendations to ensure two-dose MMR vaccine in children, measles immunity in health-care personnel (either by administration of vaccine or documentation of positive serology), with a new recommendation to ensure measles immunity in international travelers.

Pertussis on the other hand, is considered endemic in the United States with frequent small outbreaks. Fewer cases of pertussis were reported in 2011 compared to 2010. However in 2012, there has been an increased number of cases, including a large outbreak in Washington State which was labeled an epidemic [8].

In June 2005, the Advisory Committee on Immunization Practices

(ACIP) had recommended use of the tetanus, diphtheria and acellular pertussis (Tdap) vaccine in adolescents and adults up to age 64 years [9]. In October 2010, recommendations were expanded to include select patients above age 64 years, and in February 2012 the ACIP recommended use of Tdap in all patients 65 years and older [10]. Unfortunately, in spite of these expanded recommendations, the number of pertussis cases in the United States continues to increase. On July 19<sup>th</sup>, 2012 CDC officials reported that the country was headed towards the most cases in this year compared to the previous fifty years [11]. An analysis of this upswing was recently published in the New England Journal of Medicine [12].

Uniform implementation of vaccine recommendations is limited by the fact that otherwise healthy adults do not visit their health-care providers on a regular basis and do not feel the need for vaccinations. These individuals may not benefit from updated vaccination guidelines and recommendations. In addition, some health insurance plans cover the Td vaccine, but the patient has to pay out-of-pocket for the Tdap vaccine. Challenges of implementation of vaccine guidelines, including safety concerns and public misconceptions were discussed by Lawrence Hammer and colleagues [13]. Recommendations for ways to increase immunization coverage were also made.

A unique opportunity to increase uptake of MMR and Tdap vaccines exists when otherwise healthy persons make plans to travel out of the country. Though just about 50% travelers seek pre-travel health advice [14], in addition to information regarding protection from mosquito and food-borne illnesses, depending on the itinerary, these individuals are already primed to receive “travel vaccines” like hepatitis A, typhoid and yellow fever. Their visit to a travel clinic presents an opportunity to review their immunization status and offer the MMR and Tdap vaccines. The Reliant Medical Group – a large private multi-specialty group in Central Massachusetts - conducted a study of patients visiting their Travel Clinic (unpublished data – presented at the 2<sup>nd</sup> International Conference on Vaccines and Vaccination). A total of 1261 patients were evaluated at the Travel Clinic in 2011. In response to the ongoing epidemics of measles and pertussis, there was increased emphasis on measles serotesting and vaccination, along with increased vaccination with Tdap in those travelers without documented vaccination for the same. 133 MMR and 397 Tdap vaccines were administered (10.5% and 31.5% of all travelers respectively) during the study period. This

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data confirmed that a high percentage of the general population is not updated and remains at risk for these two preventable diseases.

Addressing this gap will involve increasing the awareness among physicians and patients of the ongoing epidemics, and emphasis on vaccination opportunities at any and all physician visits - primary care and specialty care including travel clinics. While research into vaccines against relatively exotic diseases continues enthusiastically and frontiers of discovery are vigorously challenged, public policy and resources should also be directed towards improving the uptake of established vaccines - MMR and Tdap - especially in the midst of the ongoing epidemics of measles and pertussis.

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