WHO Internships (Terms of Reference) for VIEW Scholars Program
January 2010

A. Examining approaches to collecting and analyzing HPV vaccine coverage data
B. County-level burden of disease estimates for viral Hepatitis A, B, C, D, and E
C. A comprehensive database on published and unpublished malaria vaccine projects globally
D. Economics of vaccine and immunization
E. Tools for integration of Hepatitis B immunization in newborn care and delivery guidelines
F. Ongoing monitoring and evaluation of the impact of WHO policy recommendations on member countries
G. School-based immunization strategy: consolidating experiences from 7 countries
H. Global surveillance data to support the introduction and use of new and underutilized vaccines
I. Non-neonatal tetanus burden in children under 5 years of age in developing countries
A. Examining approaches to collecting and analyzing HPV vaccine coverage data

**Background:**
Implementation of HPV vaccine requires coordination and involvement of multiple programs for vaccine delivery and for assessment of vaccine impact. These multiple programs (e.g., immunization, schools, adolescent health, STI, and cervical cancer) have historically worked more often in parallel rather than jointly. Vaccine coverage monitoring is critical in order to evaluate vaccine delivery programs and in order to evaluate vaccine impact 5-30 years after immunization. Coverage monitoring for HPV vaccine poses unique challenges which have not previously been necessary to address to monitor routine infant vaccine coverage.

The unique issues include:
- administration of vaccine to children who are not infants,
- target age for HPV vaccine much broader than routine infant vaccines (covering several years rather than several months; i.e., 9-13 year old girls),
- no routine fixed clinic visits such as the 6-10-14 wk or 2-4-6 month EPI schedules,
- delivery of vaccine may often occur in schools rather than in immunization clinics,
- adolescent immunization or health cards have previously been non-existent or rare.

Because of these unique issues, establishing best approaches for monitoring HPV vaccine coverage as part of routine vaccine delivery activities or as part of periodic assessments (MICS, DHS, or EPI cluster surveys) is needed.

**Scope of Work:**
Potential projects to help inform development of guidance to countries on HPV vaccine coverage monitoring are:
- Create survey questions on HPV vaccine coverage for a periodic assessment such as MICS, DHS, or an EPI cluster survey; create a dummy dataset with responses; analyze the data to identify the issues and solutions with gathering and using HPV vaccine coverage survey data
- Refine tools for collecting data on routine administrative coverage for HPV vaccine by age and by dose, including collection of denominator data
- Design an adolescent immunization or health card with high likelihood of retention over time

**Necessary Skills:** Training and experience in quantitative data analysis

**Useful, but not required:**
Experience with collection or analysis of survey data; experience evaluating vaccination coverage
B. County-level burden of disease estimates for viral hepatitis A, B, C, D, and E

**Background:**
Up-to-date estimates of the global burden of disease due to hepatitis A, B, C, D, and E virus infections are not available. In the literature, the most recent estimates date from the 1980s. Generating new estimates is important for several reasons, including that new vaccines and prevention strategies are available and countries need burden data for decision making.

To make evidence-based decisions, more recent estimates of the global disease burden are needed. The Global Burden of Diseases, Injuries, and Risk Factors (GBD) Study is an international collaborative effort in which WHO is participating. One of the first steps in this process involves collecting data on incidence and prevalence of markers for viral hepatitis by age, sex and GBD region (of which there are 21). Country-specific estimates are also needed.

As the systematic review of the literature for the regional GBD is complete, it is time to develop country estimates based on further review of available data and consultation with countries combined with existing burden models.

**Scope of Work:**
To develop county level estimates of viral hepatitis burden of disease.

**Key Activities:**
- Establish a country consultative process based on existing efforts in the immunization department (IVB).
- Search for country specific data for countries with a paucity of data based on the finalized systematic literature reviews.
- Estimate country-specific burden of disease by age and sex.
- Present findings.

**Supervision:**
Supervision will be provided by a JHU MPH and Preventive Medicine trained WHO staff member.

**Necessary Skills:**
- Fluency in English
- Proficiency with Microsoft Excel, email and word processing software
- Proficiency with literature searches on PubMed and preferably other databases
- Good interpersonal skills
C. A Comprehensive Database on Published and Unpublished Malaria Vaccine Projects Globally

Background:
WHO has been maintaining lists of malaria vaccine projects in clinical and pre-clinical evaluation since 2001. Currently a Microsoft Word format table is publicly available through a WHO website. (see [www.who.int/vaccine_research/links/MaVa/en/index.html](http://www.who.int/vaccine_research/links/MaVa/en/index.html)) This represents the main resource available to those in the malaria vaccine R&D field, who wish to be updated on activities globally. Many of the projects have not yet published details of their work, so the tables are an important addition to the published literature. Furthermore several important R&D activities have occurred, including at the clinical trial stage, without publication even many years after trial termination. Trials with negative or disappointing results are more likely to remain unpublished than those with positive results; such negative results are very important, however, for those planning malaria vaccine research.

Scope of Work:
The WHO Immunization, Vaccines & Biologicals Department seeks an intern to work under the supervision of WHO technical staff within the Initiative for Vaccine Research. The project has the following aims:

- Identifying the centres globally which have undertaken malaria vaccine R&D at the advanced pre-clinical or clinical stage over the last 10 years
- Identifying projects which have been terminated after reaching the clinical trial stage
- Contacting investigators, under the facilitation of WHO staff, to access abstract-level data on unpublished trials
- Collating published and unpublished clinical trial information into a spreadsheet format, with permission from Investigators where necessary, to make detailed information publicly available to the malaria vaccine community
- Building links in to the database for clinical trial registries and publications where available
- Identifying further data collation work desirable should further resources become available

It is intended that a review publication will arise from this project.

Necessary Skills:
Fluency in English
Proficiency with Microsoft Excel, email and word processing software
Proficiency with literature searches on PubMed and preferably other databases
Previous clinical trial experience desirable
Experience with database software such as Microsoft Access desirable
Working knowledge of French desirable
The Johns Hopkins Vaccine Initiative
Johns Hopkins Bloomberg School of Public Health

D. Economics of vaccine and immunization

Background:
The WHO Immunization, Vaccines & Biologicals Department seeks an intern to work under the supervision and guidance of WHO technical staff within EPI one or two of the following topics:
- immunization financing and vaccine procurement in low middle income countries
- Vaccine security concept and practices: data collection, synthesis and country case study
- Private sector and immunization services
- Cost effectiveness of new vaccines

Scope of Work:
The intern would be expected to conduct the following tasks:
- Web search and data collection
- Review data and reports
- Interact with people who visited the various countries to further understand/clarify issues.
- Consolidate the findings from the various sources and country visits
- Prepare notes for discussion and attend meeting with technical WHO and partners staff
- Update web pages, country fact sheets and databases

Necessary Skills:
Excellent public health skills
Fluency in writing in English is essential.
Ability of synthesize information from different sources and consolidate in a meaningful manner.
Proficiency with email and word and excel processing software, good knowledge of economics concepts and tools, some experience with developing countries and familiarity with global health initiatives
**E. Tools for integration of hepatitis B immunization in newborn care and delivery guidelines**

**Background:**
Globally, hepatitis B virus (HBV) infections are a major cause of cirrhosis and liver cancer and result in an estimated 620,000 deaths annually. In 1992, the World Health Organization (WHO) set a goal for all countries to introduce hepatitis B (HepB) vaccine into national routine infant immunization programs by 1997. In 2009, WHO recommended that all infants receive the first HepB vaccine dose within 24 hours after birth to prevent perinatal HBV transmission.

To assess implementation of newborn HepB vaccination, data is routine collected using the Joint Reporting Form used by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) to track worldwide vaccine coverage for WHO-recommended infant immunizations. In 2006, a total of 162 (84%) of 193 countries had introduced HepB vaccine into their national infant immunization schedules. Among the 193 countries, 81 (42%) reported using a schedule with a HepB vaccine birth dose (defined as a dose administered within 24 hours of birth). Worldwide, 27% of newborns received a HepB vaccine birth dose in 2006.

There are no other EPI vaccines that are recommended for routine administration within 24 hours of birth, however, other health services are delivered at this time. Tools are needed to help both EPI and MCH staff integrate services to improve coverage of the hepatitis B birth dose. This project will develop tools to better integrate provision of the hepatitis B birth dose into existing services.

**Scope of Work:**
To develop tools for integration of hepatitis B immunization in newborn care and delivery guidelines.

**Key Activities:**
- Catalog existing WHO guidelines for service delivery at the time of birth
- Discuss integration of the new hepatitis birth dose policy in updates of these guidelines.
- Develop tools for EPI and MCH health workers to improve implementation of this policy
- Present findings.

**Supervision:**
Supervision will be provided by a JHU MPH and Preventive Medicine trained WHO staff member.

**Necessary Skills:**
Fluency in English
Proficiency with Microsoft Excel, email and word processing software
Proficiency with literature searches on PubMed and preferably other databases
Good interpersonal skills
F. Ongoing monitoring and evaluation of the impact of WHO policy recommendations on member countries

**Background:**
The independent advisory function of the Strategic Advisory Group of Experts (SAGE) on immunization policy and strategies is fundamental to WHO’s mandate to provide global leadership in setting norms and policies for the use of vaccines.

WHO issues a series of regularly updated position papers on vaccines against diseases of public health importance. The papers summarize background information on the respective diseases and vaccines, and conclude with the current WHO position on their use in the global context. This WHO position follows the direction of SAGE which provides oversight in setting the agenda for the issues under consideration, deliberating the scientific and operational evidence in each case, and drafting and reviewing technical content of the final document. WHO position papers are designed for use mainly by public health authorities and their immunization programme managers. However, they are also of critical value to licensing and regulatory bodies, vaccine manufacturers, the medical community and the scientific media. WHO position papers are published in the Weekly Epidemiological Record and translated in all the official UN languages and posted on the IVB website with additional relevant information.

During the implementation of the 2006-09 Strategic Plan, the IVB Director’s Office convened an independent Stakeholder’s Panel representing the global community was constituted with main objective to determine the impact of policy recommendations and norms and standards set by WHO and formulated by its key advisory committees. The panel concluded that WHO Vaccine Advisory Committees play an increasingly central role in determining global vaccine policy. WHO Vaccine Advisory Committee recommendations have become a necessary step in the pathway to the introduction and use of vaccines, especially in developing countries and, as a consequence, have clear and significant impact. The stakeholder’s panel recommended that WHO take immediate steps to consolidate and build on the successes of its Vaccine Advisory Committee reformation. Recommendations were provided in five areas: the mission and objectives of the Advisory Committees; the structure of Committees and their relation to WHO; staffing resources and agenda prioritization; monitoring and evaluation; and communications.

In response to the stakeholders' panel recommendations, the IVB department has drafted a plan of action which includes an evaluability assessment and proposal for the systematic, ongoing monitoring and evaluation of the impact of WHO policy recommendations on member countries adoption of vaccine and immunization-related policies and that will for the basis for the implementation starting in 2010 of the routine monitoring of key recommendations attributes and uptake of the recommendations.
The Johns Hopkins Vaccine Initiative
Johns Hopkins Bloomberg School of Public Health

**Scope of Work:**
The WHO Immunization, Vaccines & Biologicals Department seeks an intern to work under the supervision of the Senior Health Adviser and Junior Professional Officer within the Immunization Policy Unit to help with the:
- implementation of the monitoring framework of the impact of and access to WHO policy recommendations
- development of a comprehensive set of proactive communications approaches to an extended audience of potential decision makers/influencers at country level.

The specific activities and project(s) will be agreed with the intern and will depend on period set for the internship, its duration, as well as the skills and interest of the incumbent.

**Necessary Skills:**
Fluency in English
Proficiency with email, web and web search engines and word processing and presentations software
Proficiency with literature searches on PubMed and preferably other databases
An understanding of surveillance and monitoring systems and their strengths and limitations
Experience in communications is desirable
Experience with database software such as Microsoft Access desirable
Working knowledge of French desirable
G. School-based immunization strategy: Consolidating experiences from 7 countries

**Background:**
The Global Immunization Vision and Strategy 2006-2015 (GiVS) was welcomed by the World Health Assembly (WHA) and UNICEF’s executive Board in 2005 as a means of reaching the immunization-related targets set by United Nations Special Assembly on Children (2002)

Among other strategies, the GiVS calls "to protect more people in a changing world", including to 'expand vaccination beyond the traditional target group'. School-based immunization is one such strategy that holds the promise of being a delivery strategy to older children. With HPV vaccine becoming available in the next few years, and with countries interested in introducing various booster doses in childhood, a better understanding of school-based immunization is all the more important.

As many countries have requested information on such school-based immunization strategies, WHO and partners are collecting experiences from a few countries with existing school-based immunization programmes. Experiences have been collected from Indonesia, Malaysia, Sri Lanka and further visits are planned for Syria and Lebanon and two countries in Africa.

WHO plans that the results of the various visits be compiled into a single document and be shared with other countries that contemplate introducing a similar strategy.

**Scope of Work:**
The WHO Immunization, Vaccines & Biologicals Department seeks an intern to work under the supervision and guidance of WHO technical staff within EPI. The intern would be expected to conduct the following tasks:

- Review reports of country visits conducted to document school-based immunization.
- Interact with people who visited the various countries to further understand/clarify issues.
- Consolidate the findings from the various visits in a way that could be useful for countries planning to introduce school-based immunization.
- Send draft version for review and comments to selected WHO staff, partners and countries visited.
- Prepare a final document based on the feedback received.

**It is intended that a review publication will arise from this work.**

** Necessary Skills:**
Fluency in writing in English is essential.
Ability of synthesize information from different sources and consolidate in a meaningful manner.
Proficiency with email and word processing software
H. Global Surveillance Data to Support the Introduction and Use of New and Underutilized Vaccines

**Background:**

Vaccines are one of the most cost-effective interventions to improve public health. In addition to the six traditional vaccines against diphtheria, tetanus, pertussis, polio, measles and tuberculosis (BCG), recent years have seen a dramatic increase in the number of new vaccines that can provide additional prevention of untimely deaths and disabilities. These include vaccines against hepatitis B, invasive Haemophilus influenzae type b (Hib) disease, and rubella. As countries are considering including these new and relatively expensive vaccines into their immunization schedules, decision makers require reliable data to determine how to best allocate their resources in support of public health programmes.

During the past several years, various data collection systems have been established to provide data for decision makers around the introduction of new and underutilized vaccines. These various systems are currently being transitioned into the WHO surveillance reporting network. During this process, due attention is being paid to ensuring that data are collected in a standardized and routine manner. Data began flowing into the WHO system in 2008, and this is now allowing the first global comparisons to be made between countries. A global inventory of surveillance reporting sites was conducted during 2009 and will be repeated in March 2010. (For further information, refer to http://www.who.int/nuvi/en/)

**Scope of Work:**

The WHO Immunization, Vaccines & Biologicals Department seeks an intern to work under the supervision of WHO technical staff within the New and Underutilized Vaccines (NUVI) Group of the Expanded Programme on Immunization to undertake a project with the following aims:

- Compare the 2009 and 2010 NUVI surveillance systems to determine any significant changes;
- Assess the gathered surveillance data for trends over time and compare the data across WHO regions;
- Potentially assess data collected from a pilot project (SURVAC) to enhance surveillance in three west African countries (Cameroon, Central African Republic, and Democratic Republic of the Congo); and
- Synthesize this combined information to provide recommendations in how to target efforts to strengthen surveillance and to better understand the surveillance data.

**Necessary Skills:**

- Fluency in English
- Proficiency with Microsoft Excel, email and word processing software
- An understanding of surveillance systems and their strengths and limitations
- Experience with database software such as Microsoft Access desirable
- Working knowledge of French desirable
I. Non-neonatal Tetanus Burden in Children Under 5 Years of Age in Developing Countries

**Background:** The current global burden of non-neonatal tetanus (tetanus above 1 month of age; nNT) is unclear. A recent (unpublished) review of hospital-based studies of non-neonatal tetanus in developing countries suggests that not only has the global number of nNT cases decreased substantially in the last 20 years, but there has been a clear shift in the distribution of tetanus cases and deaths to older age groups related to the use of DTP in infancy (and booster doses of other tetanus toxoid (TT)-containing vaccines in some countries). The extent of this shift varies from country to country, depending on vaccination coverage with TT-containing vaccines. Estimates of nNT in children under 5 yr are produced regularly to monitor trends in cause-specific child mortality and the impact of vaccination and other disease control interventions. Those estimates were based on the assumption that the ratio of neonatal tetanus (NT) cases and deaths to non-neonatal tetanus cases and deaths (NT:nNT) is fixed and constant across countries. The specific ratio was derived from age-specific tetanus data collected predominantly during the pre-vaccine era. However, disease risk for NT and nNT are different and independent, as are the vaccination programs to control them (TT given to women of childbearing age or during pregnancy for NT; DTP in infancy with TT-containing booster doses for nNT). Thus, estimates of nNT based on estimated NT burden are likely to have been inaccurate for many countries as they were directly dependent on the status of NT elimination programs while taking no account of the impact of DTP3 use. A new approach to estimating country-specific and global burdens of nNT in children under 5 yr is clearly needed to provide more accurate inputs for WHO estimates of child mortality.

**Scope of Work:** The WHO Immunization, Vaccines & Biologicals Department seeks an intern to work under the supervision of WHO technical staff within the Immunization Strengthening (IMS) Group of the Expanded Programme on Immunization to undertake a project with the following aims:

- Review published and unpublished studies of tetanus in developing countries; abstract pertinent data on the incidence and age distribution of tetanus cases and age-specific mortality,
- Review DTP coverage data from surveys performed during relevant time periods in the countries where the tetanus studies took place to estimate likely DTP coverage in the tetanus study areas; collect human development indicator (HDI) data for all study sites
- Assess the collected data for temporal patterns of nNT disease and mortality in children under 5 yrs, and associations between nNT and coverage with DTP / other TT-containing vaccines and other potential predictors such as region and HDIs.

**Necessary Skills:**
Fluency in English;
Proficiency with Microsoft Excel, email and word processing software
Understanding of basic epidemiologic analysis desirable
Experience with database and statistical software such as Microsoft Access and Stata desirable
Working knowledge of French desirable, especially ability to read French