

Teaching Vaccine Economics Everywhere
Syllabus
PROGRAM EVALUATION

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Synopsis

Introduces the fundamental principles of program evaluation for vaccine programs in low and middle-income countries (LMIC), including design, implementation and analysis. Participants will develop skills to apply monitoring and evaluation (M&E) frameworks for vaccine programs. Topics include vaccine program indicators, the evaluation of ongoing programs and test of new interventions being considered for broader adoption; implementation of an evaluation in the field; procedures for collecting and analyzing data, including health system data, to make strategic decisions

Objectives: Upon completing this course students will be able to:

1. Outline monitoring and evaluation frameworks and standard indicators for measuring vaccine program processes, outcomes and impact.
2. Understand the different methods for measuring effectiveness of programs, including the analysis of health system data to make strategic decisions.
3. Understand the underlying statistical principles for designing an evaluation.
4. Identify and assess existing research for strategic programmatic decision-making.
5. Assess quality and adequacy of an evaluation plan.

Course reference materials

Wynn BO, Dutta A, Nelson MI. Challenges in Program Evaluation of Health Interventions in Developing Countries. Santa Monica, CA: RAND Corporation, 2005. Available at <https://www.rand.org/pubs/monographs/MG402.html> .

Friedman LM, Furberg CD, DeMets DL. (Editors). Fundamentals of Clinical Trials. Springer, New York. 4th edition. 2010.

Donner A, Klar N. Design and Analysis of Cluster Randomization Trials in Health Research. Arnold Publishing Co: London, United Kingdom, 2000.

LECTURE TOPICS AND ASSIGNED READINGS

Session 1 An introduction to program evaluation (GEORGE)

LEARNING OBJECTIVES

By the end of the session students will be able to:

1. Illustrate the importance of program evaluation, including the role of evaluation in financial decision-making.
2. Describe frequently-used evaluation methods and the related data requirements.
3. Examine the major challenges in conducting large-scale effectiveness evaluations;

READINGS

1. Victora CG, et al. (2011) Evaluations of large-scale health programs. In Merson MH, et al. (Eds.), Global Health: Diseases, Programs, Systems and Policies, 3rd Edition. 2011. Sudbury MA: Jones & Bartlett Learning, pp. 815-879
2. Tharmaphornpilas P, Jiamsiri S, Boonchaiya S, Rochanathimoke O et al. Evaluating the first introduction of rotavirus vaccine in Thailand: Moving from evidence to policy. Vaccine. 2017 Feb 1;35(5):796-801.
3. Pooripussarakul S, Riewpaiboon A, Bishai D, Muangchana C, Tantivess S. What criteria do decision makers in Thailand use to set priorities for vaccine introduction? BMC Public Health. 2016 Aug 2;16:684

Session 2 Using epidemiology and economics in program evaluation (David help)

LEARNING OBJECTIVES

By the end of the session students will be able to:

1. Describe the foundational elements of epidemiology: Populations, Events, Rates
2. Describe the foundational elements of economics: Choices, Consequences, Counterfactuals, Costs
3. Explain how vaccine monitoring and evaluation frameworks are based on populations, events, and rates being measured under counterfactual conditions.

READINGS

1. Gordis, L.: Epidemiology, 5th edition, Elsevier-Saunders, Philadelphia, 2014. Select chapters.
2. GAVI Alliance Monitoring and Evaluation Framework and Strategy 2011-2015. Available at <http://www.gavi.org/library/gavi-documents/strategy/gavi-alliance-monitoring-and-evaluation-framework-and-strategy-2011-2015/>
3. Chen RT, Orenstein WA. Epidemiologic methods in immunization programs. Epidemiol Rev. 1996;18(2):99-117.

Session 3 Indicators for vaccine programs (GEORGE)

LEARNING OBJECTIVES

By the end of the session students will be able to:

1. Utilize a variety of vaccine program outcome and cost indicators; understanding their key attributes, context and use.
2. Evaluate health system outcome and process measures (prevalence, incidence, rates of disease, coverage, service quality, cold chain, wastage)
3. Identify sources of data for calculating vaccine program indicators, including examples from program reports and on-line tools.
4. Assess the quality of relevant data sources and reconcile coverage estimates from different data sources

READINGS

Gavi 2016-2020 Strategy Indicator Definitions. Available at www.gavi.org/library/gavi-documents/strategy/gavi-2016-2020-strategy-indicator-definitions/

CASE-STUDY RESOURCES

1. RED-QI (Webinar)
<http://bidinitiative.org/bid-learning-network/posts/bln-webinar-red-qi-reaching-every-district-incorporating-quality-improvement/>
 - a. <http://bidinitiative.org/wp-content/uploads/Recording.mp4>
 - b. http://mpffs6apl64314hd71fbb11y.wpengine.netdna-cdn.com/wp-content/uploads/2016/04/UI-FHS_HowtoGuide.pdf
2. Improving the quality of immunization and surveillance data in Burkina Faso (Webinar)
<http://bidinitiative.org/bid-learning-network/posts/bln-webinar-improving-the-quality-of-immunization-and-surveillance-data-in-burkina-faso/>

"In this webinar, the presenter shared lessons learned from Burkina Faso's experience in improving the quality of immunization and surveillance data for Expanded Program on Immunization (EPI) target diseases. The presentation discussed the harmonization of surveillance data on EPI target diseases between the various actors involved in surveillance and data management service, notably the Directorate of Prevention by Vaccination (DPV), Directorate for Disease Control and the Reference Laboratories. The presentation also walked the audience through the steps that have been taken by Burkina Faso in improving their immunization data quality in line with the WHO/GAVI guidelines. These range from data validation, self-assessment of data quality, and evaluation of the immunization registry data quality to field reviews within the research framework."

Session 4 Measures of program effectiveness and impact

LEARNING OBJECTIVES

By the end of the session students will be able to:

CASE-STUDY RESOURCES

1. Access, Bottlenecks, Costs, and Equity (ABCE) project in Zambia [Report]
http://www.healthdata.org/sites/default/files/files/policy_report/2015/ABCE_Zambia_finalreport_Jan2015.pdf
2. PRISM Framework [Guidance document and example]
 - a. <http://bidinitiative.org/bid-learning-network/resources/prism-tools-for-assessing-monitoring-and-evaluating-rhis-performance/>
 - b. Results from Uganda:
<https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-10-188>
3. Increasing immunization coverage at the health facility level (Worked examples Annex 2)[Guidance document]
http://apps.who.int/iris/bitstream/10665/67791/1/WHO_V%26B_02.27.pdf

Session 5 Surveys and surveillance for vaccine programs

LEARNING OBJECTIVES

By the end of the session students will be able to:

1. Employ the process of collection, analysis and interpretation of surveillance data vital to guide vaccination policies and programs and ensure immunization targets are being reached.
2. List the protocols and guidelines on assessing disease burden using a variety of methods such as disease surveillance, or population-based studies, such as Multi-indicator Cluster Survey, Lot-Quality Assurance Sampling, Surveillance of Adverse Events Following Immunization, etc.
3. Describe the importance and implementation of laboratory surveillance networks for vaccine programs.
4. Using health system administration data for decision-making in vaccine programs, such as Mother Child Tracking System.

READINGS

1. Nsubuga P, White ME, Thacker SB, et al. Public Health Surveillance: A Tool for Targeting and Monitoring Interventions. In: Jamison DT, Breman JG, Measham AR, et al., editors. Disease Control Priorities in Developing Countries. 2nd edition. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2006. Chapter 53. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK11770/> Co-published by Oxford University Press, New York.
2. World Health Organization. Vaccination Coverage Cluster Surveys: Reference Manual. Geneva. WHO 2015. Available at http://www.who.int/immunization/monitoring_surveillance/Vaccination_coverage_cluster_survey_with_annexes.pdf. Accessed on April 17, 2017.
3. Brown AE, Okayasu H, Nzioki MM, Wadood MZ, Chabot-Couture G, Quddus A, Walker G, Sutter RW. Lot quality assurance sampling to monitor supplemental immunization activity quality: an essential tool for improving performance in polio endemic countries. J Infect Dis. 2014 Nov 1;210 Suppl 1:S333-40.

4. Mulders MN, Rota PA, Icenogle JP, Brown KE, Takeda M, Rey GJ, Ben Mamou MC, Dosseh AR, Byabamazima CR, Ahmed HJ, Pattamadilok S, Zhang Y, Gacic-Dobo M, Strebel PM, Goodson JL. Global Measles and Rubella Laboratory Network Support for Elimination Goals, 2010-2015. *MMWR Morb Mortal Wkly Rep*. 2016 May 6;65(17):438-2
5. Hortal M, Estevan M, Laurani H, Iraola I, Meny M; Paysandú/Salto Study Group. Hospitalized children with pneumonia in Uruguay: pre and post introduction of 7 and 13-valent pneumococcal conjugated vaccines into the National Immunization Program. *Vaccine*. 2012 Jul 13;30(33):4934-8.

CASE-STUDY RESOURCES

1. Making the Case for Improved Immunization Data in Zimbabwe (Webinar)
<http://bidinitiative.org/bid-learning-network/posts/bln-webinar-making-the-case-for-improved-immunization-data-in-zimbabwe/>
"In this webinar, the presenter walked the audience through the Zimbabwe Expanded Program on Immunization (ZEPI) and offered a brief background and historical perspective. The speaker shared lessons learned in the process of implementing the EPI program and its integration into the national health information and surveillance system. This presentation also discussed future plans for improved EPI data management using an electronic reporting system."
2. Rolling Out a Nationwide Web-Based DHIMS2 in Ghana (Webinar)
<http://bidinitiative.org/bid-learning-network/posts/webinar-rolling-out-a-nationwide-web-based-dhims2-in-ghana/>
"This webinar focused on the practical aspects of rolling out a nationwide web-based district health information system (DHIMS2) in Ghana. The presenters highlighted the opportunities and challenges as they have encountered them in Ghana, and elaborated on important lessons that they have learned. They addressed critical issues of implementing a maternal/child register and the webinar should be of interest to both technical and non-technical personnel with an interest in setting up immunization registries in an African context."

Session 6 Using data for decision-making in vaccine programs

LEARNING OBJECTIVES

By the end of the session students will be able to:

1. Identify and clearly articulate the programmatic question that needs to be addressed.
2. Employ existing data sources to answer the program question; including the collection, compilation, processing, or analysis of data.
3. Integrate simple tools with existing data collection mechanisms to answer program-specific evaluation questions.
4. Understand how to interpret data sources for decision-making, including the limitations of programmatic data.

READINGS

1. Torvaldsen S, McIntyre PB. Observational methods in epidemiologic assessment of vaccine effectiveness. *Commun Dis Intell Q Rep*. 2002;26(3):451-7.
2. Shrestha S, Shrestha M, Wagle RR, Bhandari G. Predictors of incompleteness of immunization among children residing in the slums of Kathmandu valley, Nepal: a case-control study. *BMC Public Health*. 2016 Sep 13;16:970.
3. Freund R, Le Ray C, Charlier C, Avenell C, Truster V, Tréluyer JM, Skalli D, Ville Y, Goffinet F, Launay O; Inserm COFLUPREG Study Group. Determinants of non-vaccination against pandemic 2009 H1N1 influenza in pregnant women: a prospective cohort study. *PLoS One*. 2011;6(6):e20900.
4. Uddin MJ, Shamsuzzaman M, Horng L, Labrique A, Vasudevan L, Zeller K, Chowdhury M, Larson CP, Bishai D, Alam N. Use of mobile phones for improving vaccination coverage among children living in rural hard-to-reach areas and urban streets of Bangladesh. *Vaccine*. 2016 Jan 4;34(2):276-83.
5. Cetorelli V. The impact of the Iraq War on neonatal polio immunisation coverage: a quasi-experimental study. *J Epidemiol Community Health*. 2015 Mar;69(3):226-31.
6. Juon HS, Strong C, Kim F, Park E, Lee S. Lay Health Worker Intervention Improved Compliance with Hepatitis B Vaccination in Asian Americans: Randomized Controlled Trial. *PLoS One*. 2016 Sep 12;11(9):e0162683
7. Chen L, Du X, Zhang L, van Velthoven MH et al. Effectiveness of a smartphone app on improving immunization of children in rural Sichuan Province, China: a cluster randomized controlled trial. *BMC Public Health*. 2016 Aug 31;16:909.

CASE-STUDY RESOURCES

1. Albania pilots an immunization information system (Report)
http://bidinitiative.org/wp-content/files_mf/14026888524.ProjectOptimizeAlbaniapilotsimmunizationinformationsystem.pdf
"The Albanian Ministry of Health, in collaboration with project Optimize, developed a registry-based immunization information system (IIS) and piloted it in Shkoder district. This factsheet illustrates how the data the new system produces is used to improve the management of the vaccination program, how it is changing the way people collaborate, how it ensures timely and equal access to immunization for all children, and how it reduces the administrative burden on staff."
2. Improving health information systems for decision making across five sub-Saharan African countries: Implementation strategies from the African Health Initiative (Multi-Country examples)
<https://www.biomedcentral.com/gc/1472-6963/13/S2/S9>
"Weak health information systems (HIS) are a critical challenge to reaching the health-related Millennium Development Goals because health systems performance cannot be adequately assessed or monitored where HIS data are incomplete, inaccurate, or untimely. The Population Health Implementation and Training (PHIT) Partnerships were established in five sub-Saharan African countries (Ghana, Mozambique, Rwanda, Tanzania, and Zambia) to catalyze advances

in strengthening district health systems. Interventions were tailored to the setting in which activities were planned.”

3. Improving data use in decision making (PDF File)

http://bidinitiative.org/wp-content/files_mf/1402703930ImprovingDataUseinDMIIntervention2StrengthenHSFINAL.pdf

“This paper will discuss the unique role of health data in strengthening the other five building blocks of health systems; define specific interventions to strengthen the use of data in decision making; and provide a framework for developing, monitoring, and evaluating interventions to improve the use of and demand for data (see figure A). The overall aim of the paper is to articulate specific interventions that can improve the demand for and use of data in decision making so that improvements in the other health building blocks can be realized.”

Session 7 Building systems that respond to data and evidence

LEARNING OBJECTIVES

By the end of the session students will be able to:

1. Understand the practice of evidence-based decision-making for vaccine programs.
2. Construct a feedback loop including data generation, utilization of information for decision-making, appraise the impact of the intervention and appropriately modify programs.
3. Assess the quality of published studies and data.
4. Discern the applicability findings to specific vaccine programs based on factors including context and reproducibility.

READINGS

1. Vaessen J. Challenges in impact evaluation of development interventions: opportunities and limitations for randomized experiments. Antwerp, Belgium: Institute of Development Policy and Management, 2010. Available at http://www.enterprise-development.org/wp-content/uploads/Opportunities_Limitations_Randomized_Experiments.pdf.
2. Hoang HT, Leuridan E, Maertens K, Nguyen TD, et al. Pertussis vaccination during pregnancy in Vietnam: Results of a randomized controlled trial Pertussis vaccination during pregnancy. Vaccine. 2016 Jan 2;34(1):151-9. doi: 10.1016/j.vaccine.2015.10.098. Epub 2015 Oct 31.