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| AFYA BORA CONSORTIUM GLOBAL HEALTH LEADERSHIP FELLOWSHIP PROGRAM |
| IMPLEMENTATION SCIENCE AND HEALTH SYSTEMS RESEARCH |
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**AFYA BORA CONSORTIUM**

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**Guide for Fellows and Instructors**

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COURSE OVERVIEW

The past several decades have witnessed remarkable advances in medical science with the discovery of new drugs, vaccines, and diagnostic tools that have the capacity to lead to substantial improvements in global health. However, the translation of research findings into practice has often been slow and uneven, with regional variations. As a result, many of the solutions to health problems are not applied in a timely fashion, creating a widening gap between what is known to work and what is done in practice (referred to by the World Health Organization as the “know-do gap”). Implementation science has the potential to reduce this gap by applying systematic research and evaluation approaches to identify and address the barriers to effective replication and scale-up of evidence-based interventions in local settings. This training module provides an introduction to the emerging field of implementation science by outlining various methods that can be applied to improve implementation (including applied engineering, management tools, health systems and policy research), and through experiential case studies from global health leaders.

# COURSE LEARNING OBJECTIVES

This module explores the current literature on implementation science; introduces strategies for using innovative scientific methods and tools of diverse disciplines to understand and overcome impediments to implementation and facilitate scale-up; and uses case studies to identify and contextualize implementation successes and failures. At the end of this module, the student should be able to:

1. Identify the major factors that limit the translation of efficacy trials to effective health programs, and describe the role of complementary research methods in the development of evidence-based health programs and policies.
2. Explain appropriate research and evaluation methods to overcome implementation impediments and facilitate timely scale-up of proven interventions with high levels of fidelity and effectiveness.
3. Contextualize and explain real-world examples in which sound interventions failed or succeeded.
4. Describe the framework for designing successful implementation strategies and applying them to a real world problem.

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| **TEACHING METHODS**  The material is presented in a format that includes two complementary types of sessions. The first defines the conceptual framework and relevant methodologies for implementation science. In order to facilitate assimilation of the didactic content, methodological sessions will include an interactive exercise for participants to apply the course methodologies to their group projects. The second type of session will be case studies from experts that apply the module’s conceptual framework to public health problems of global health importance, focusing on practical successes and failures in implementation 10-20 years post innovation. Each session will run one and a half hours. Methodological sessions will include approximately 30 minutes of didactic lecture (**note: a number of sessions will include an additional taped lecture that participants are expected to watch prior to the course session**), 25 minutes for the interactive exercise, 25 minutes for discussion moderated by course faculty, and 10 minutes for course faculty to summarize the content and synthesize how the covered methodology fits into the module framework. Case study sessions on day one to four will include approximately 50 minutes of presentation by guest lecturers, followed by 30 minutes of discussion moderated by course faculty, and 10 minutes for course faculty to highlight how the methods covered in the course apply to the presented case. Case study sessions on the final day of the course will include 30 minutes of group presentation and questions and answers for the group (see below), followed by 30 minutes of presentation, 20 minutes of questions and answers, and 10 minutes for course faculty to highlight how the methods covered in the course apply to the presented case. In addition to these in-class lectures, on the third day of the module, course participants will break into 4 groups and will make field visits to observe program implementation and interview program managers related to the group presentations detailed below.  **GROUP PRESENTATION**  Fellows will divide into 4 small groups of 5-6 and work in teams to apply the training module’s methodological framework to implementation of a national program or enhancement of a national program in Kenya related to one of the last four case studies. Each group will have 15 minutes to present on their topic, with an additional 15 minute question and answer session with the other fellows, co-directors and case study faculty from that session. During their presentation, each group will play the role of the Kenyan Minister of Health and senior staff addressing members of Parliament to propose and request resources to implement the respective national health program or program enhancement. The group presentations should be designed according to the following standardized format:   1. **Problem to address** (2-3 slides). Provide an analysis of the problem to be taken on, including a situation analysis and overview of the current implementation strategy, successes and gaps in the assigned country. 2. **Justification of why the program or package would make a difference** (1-2 slides). Describe a framework that demonstrates how program implementation is expected to address the gaps described in the previous slides. 3. **Implementation strategy** (5-8 slides). Describe a 5-year strategy detailing the operational approach, major outputs, annual milestones, and measurement framework, incorporating the methods covered in the course and indicating how each will be used to understand and improve implementation and scale-up. 4. **Expected return on investment** (1 slide). Describe expected results by year in terms of program coverage and related reductions in burden of disease or selected problem. 5. **Budget** (1 slide). Provide an estimate of annual program costs by major cost categories.   **INDIVIDUAL REFLECTION AND ASSESSMENT**  At the end of each day, participants will spend 15 minutes reflecting in writing on the methods and case study presented during the day, focusing on how methods covered in the module applied to the case studies, and general reflection on how the methods can be applied to improve program delivery.  **MODULE LOCATION**  ACTS Training Center, University of Nairobi Department of Pediatrics. |

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# IMPLEMENTATION SCIENCE AND HEALTH SYSTEMS RESEARCH MODULE SCHEDULE

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| Time | DAY 1 | DAY 2 | DAY 3 | DAY 4 | DAY 5 |
| 08:30 – 10:00 | Introduction to Implementation Science | Economic Analysis and Cost Effectiveness Analysis\* | Site Visits | Dissemination Research\* and Social Marketing\* | **Improving Access and Quality of ANC and Delivery Services** and Group Presentation 1 |
| 10:00 – 10:30 | Break | Break | Break | Break |
| 10:30 – 12:00 | Surveillance to Measure Impact and Inform Strategies\* | Qualitative Health Systems Research | Organizational Readiness for Change | **Male Circumcision for HIV Prevention in Kenya** and Group Presentation 2 |
| 12:00 – 13:00 | Lunch | Lunch | Lunch | Lunch | Lunch |
| 13:00 – 14:30 | **Case Study:** Towards eMTCT in Kenya | Operations Research as a Contributing Discipline\* | Quality Improvement as a Management Tool\* | Q&A on Group Presentations | **HPV Vaccine Introduction for Cervical Cancer Prevention** and Group Presentation 3 |
| 14:30 – 15:00 | Break | Break | Break | Break | Break |
| 15:00 – 16:30 | Overview of Impact Evaluation and Study Designs to Measure Effectiveness\* | **Case Study:** Mental Health Services in Kenya\* | Stakeholder Analysis and Policy Research | At the end of each Case Study, Instructors will plan to lead a wrap-up discussion to identify skills and competencies that were profiled | **Diabetes Control in Kenya** and Group Presentation 4 |
| 16:30 – 17:30 | Group Work, Reading and Reflection Time | Group Work, Reading and Reflection Time | Group Work, Reading and Reflection Time | Course Synthesis |
| ***\*Session for which prerecorded lectures will be used*** | | | | | |

# IMPLEMENTATION SCIENCE AND HEALTH SYSTEMS RESEARCH MODULE KNOWLEDGE AND SKILLS BY COMPETENCY AREA

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| **Competency** | **Knowledge** | **Skills** |
| Effectiveness Evaluation | Knowledge of different designs to evaluate program effectiveness, and their relative strengths and weaknesses | Design an appropriate and robust evaluation approach to identify effective preventive and curative health programs and service delivery approaches |
| Surveillance | Knowledge of the core elements of surveillance systems, different types of surveillance systems, and their use | Use data from systems to measure impact and inform strategies |
| Economic Analysis | Knowledge of different economic analysis designs, and their relative strengths and weaknesses | Identify which economic analysis approaches are most appropriate to answer specific policy and implementation related questions |
| Operations Research | Knowledge of systems analysis techniques and their application to improve health programs and delivery systems | Apply systems analysis and improvement techniques to strengthen health programs and delivery approaches |
| Quality Improvement | Knowledge of quality improvement techniques and their strength and limitations for improving preventive and curative health programs and systems | Design and apply quality improvement techniques to identify and test innovations in health programs and systems |
| Qualitative Research | Knowledge of qualitative research methods and their relevance in improving the delivery of health services | Apply qualitative data gathering methods and analysis techniques to improve understanding and functioning of health programs |
| Stakeholder and Policy Analysis | Knowledge of stakeholder and policy analysis approaches and their impact on policy development | Identify and map stakeholders to support development of evidence-based health programs and related policies |
| Social Marketing and Dissemination Research | Knowledge of social marking and dissemination research techniques and their relevance for improving knowledge uptake within health systems and communities, as well as improving health service utilization | Design an information dissemination and marketing approach for a health program |
| Case studies | Knowledge of the complexities and common implementation issues faced by leaders of large health programs, as well as systematic methods and approaches that have been successful in overcoming these challenges | Identify and articulate methods most relevant to address challenges encountered in the module case studies |
| Group Presentations | Knowledge of the current state of program scale-up in Kenya for priority health programs, challenges faced by program managers, and strategies for using implementation science tools to improve program implementation | Design a national scale-up plan relevant for Kenya that systematically applies the methods covered in the course to improve the program’s coverage, quality, pace and efficiency |

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# IMPLEMENTATION SCIENCE AND HEALTH SYSTEMS RESEARCH MODULE DETAILED SESSION OBJECTIVES, READINGS

## Session 1: Introduction to Implementation Science

**Bryan Weiner, Judith Wasserheit, Anne Pulei, Serah Ngugi**

**Learning Objectives:**

1. Describe why implementation science is important to global health
2. Summarize a framework for using implementation science to facilitate the translation of knowledge to successful program implementation

**Readings:**

*Recommended:*

Eccles M, Mittman B. Welcome to implementation science. *Implementation Science*. 2006;1(1):1-3.

Glasgow R, Vinson C, Chambers D, Khoury M, Kaplan R, Hunter C. National Institutes of Health Approaches to Dissemination and Implementation Science: Current and Future Directions. *AJPH*. 2012;102:7.

Madon T, Hofman K, Kupfer L, Glass R. Implementation Science. *Science*. 2007;**318**:(1728-1729).

Odeny T, Padian N, Doherty M, Baral S, Beyrer C, Ford N, Geng E. Definitions of Implementation Science in HIV/AIDS. *Lancet HIV* 2015;2(5):e178-180.

Padian N, McCoy S, Balkus J, Wasserheit J. Weighing the gold in the gold standard: challenges in HIV prevention research. *AIDS* 2010;24(9):621-635*.*

Remme J, Adam T, Becerra-Posada F, et al. Defining Research to Improve Health Systems. *PlosMed* 2010;7(11):1-7.

Sanders D, Haines A. Implementation research is needed to achieve international health goals. *PLOS Med*. June 2006; **3**(6): 719-722.

## Session 2: Surveillance to Measure Impact and Inform Strategies

**Mary Schmitz**

**Learning Objectives:**

1. Understand the value of core systems of information collection to monitor disease and health programs in developing countries
2. Understand barriers to implementing these systems and applications of these concepts in developed countries as well

**Readings:**

Validity of a Minimally Invasive Autopsy for Cause of Death Determination in Adults in Mozambique: An Observational Study. (2016). PLoS Medicine., 13(11), PLoS medicine. 2016, Vol.13(11).

Phillips-Howard, P. A., Odhiambo, F. O., Hamel, M., Adazu, K., Ackers, M., van Eijk, A. M., … Laserson, K. F. (2012). Mortality Trends from 2003 to 2009 among Adolescents and Young Adults in Rural Western Kenya Using a Health and Demographic Surveillance System. PLoS ONE, 7(11), e47017. http://doi.org/10.1371/journal.pone.0047017

## Session 3: Case Study: Towards eMTCT in Kenya

**Ruth Nduati**

**Learning Objectives:**

1. To describe the process and results obtained through the planning, implementation and scale-up of pMTCT services in Kenya
2. To identify steps taken to design and establish surveillance, impact evaluation and economic analysis approaches by the pMTCT program in Kenya, major challenges and successful strategies to overcome these challenges

**Readings:**

Rustagi, A., Gimbel, S., Nduati, R., Cuembelo, M., Wasserheit, J., Farquhar, C., . . . Sherr. (n.d.). Health facility factors and quality of services to prevent mother-to-child HIV transmission in Côte d'Ivoire, Kenya, and Mozambique. International Journal of STD and AIDS, International journal of STD and AIDS , 2016.

Gimbel, S., Voss, J., Rustagi, A., Mercer, M. A., Zierler, B., Gloyd, S., … Sherr, K. (2014). What does high and low have to do with it? Performance classification to identify health system factors associated with effective prevention of mother-to-child transmission of HIV delivery in Mozambique. Journal of the International AIDS Society, 17(1), 18828.

Rustagi, A., Gimbel, S., Nduati, R., Cuembelo, M., Wasserheit, J., Farquhar, C., . . . Sherr. (n.d.). Implementation and Operational Research: Impact of a Systems Engineering Intervention on PMTCT Service Delivery in Côte d'Ivoire, Kenya, Mozambique: A Cluster Randomized Trial. Journal of Acquired Immune Deficiency Syndromes JAIDS., 72(3), E68-E76

Almeida, C., & Báscolo, E. (2006). Use of research results in policy decision-making, formulation, and implementation: A review of the literature. Cadernos De Saúde Pública Reports in Public Health: Publication of the Escola Nacional De Saúde Pública, Fundação Oswaldo Cruz., 22 Suppl, S7-19; discussion S20

Gimbel, S., Voss, J., Mercer, M. A., Zierler, B., Gloyd, S., Coutinho, M. J., ... & Sherr, K. (2014). The prevention of mother-to-child transmission of HIV cascade analysis tool: supporting health managers to improve facility-level service delivery. *BMC research notes*, *7*(1), 743

## Session 4: Overview of Impact Evaluation and Study Designs to Measure Effectiveness

**Anne Njoroge**

**Learning Objectives:**

1. Familiarize with methods to evaluate programs at scale
2. Understand and explain the difference between randomized designs that are RCTs conducted for specific interventions and treatments, versus randomized designs for large scale programs
3. Identify the types of health metrics and sources of data for health metrics
4. Recognize the importance of impact evaluations in the design of sound health policies

**Readings:**

Comfort, A., Chankova, S., Juras, R., Hsi, C., Peterson, L., & Hathi, P. (n.d.). Providing free pregnancy test kits to community health workers increases distribution of contraceptives: Results from an impact evaluation in Madagascar. Contraception, 93(1), 44-51.

Wagenaar, B. H., Sherr, K., Fernandes, Q., & Wagenaar, A. C. (2015). Using routine health information systems for well-designed health evaluations in low-and middle-income countries. *Health policy and planning*, *31*(1), 129-135.

Ngabo, F., Tate, J. E., Gatera, M., Rugambwa, C., Donnen, P., Lepage, P., ... & Parashar, U. D. (2016). Effect of pentavalent rotavirus vaccine introduction on hospital admissions for diarrhoea and rotavirus in children in Rwanda: a time-series analysis. *The Lancet Global Health*, *4*(2), e129-e136.

Monitoring and evaluation of health systems strengthening. WHO, November 2009

When will we ever learn? Improving lives through impact evaluation. Center for Global Development, May 2006.

Nissou I, Dossa, Aline Philibert, Alexandre Dumount. Using routine health data and intermittent community surveys to access the impact of maternal and neonatal health interventions in low-income countries: A systematic review. International Journal of Gynecology and Obstetrics.

***Session*** ***5:* Economic Analysis and Cost Effectiveness Analysis**

**Peter Nguhiu**

**Learning Objectives:**

1. Provide an overview of economic analysis methods
2. Provide an overview of the application of cost effectiveness analysis

**Readings:**

Galárraga, O., Shah, P., Wilson-Barthes, M., Ayuku, D., & Braitstein, P. (2018). Cost and cost-effectiveness of voluntary medical male circumcision in street-connected youth: findings from an education-based pilot intervention in Eldoret, Kenya. *AIDS research and therapy*, *15*(1), 24.

Vassall, A., Sweeney, S., Kahn, J., Gomez, G., Bollinger, L., & Marseille, E. (2017). Reference Case for Estimating the Costs of Global Health Services and Interventions.

Goodacre, S., & McCabe, C. (2002). An introduction to economic evaluation. Emergency Medicine Journal : EMJ, 19(3), 198–201.

Kahn, J. G., Marseille, E., & Auvert, B. (2006). Cost-Effectiveness of Male Circumcision for HIV Prevention in a South African Setting . PLoS Medicine, 3(12), e517.

Jowett, M. (2000). Safe Motherhood interventions in low-income countries: An economic justification and evidence of cost effectiveness. Health Policy., 53(3), 201-228.

Baltussen, R; Taghreed, A; Tan Torres, T; Hutubessy, R; Acharya, A; Evans, DB; Murray, CJ; (2004) Making Choices in Health: WHO Guide to Cost-effectiveness Analysis. WHO, Geneva.

[**Session 6: Operations Research as a Contributing Discipline**](#_Session_7:_Operations)

**George Nyori**

**Learning Objectives:**

1. Understand Basic Lean Implementation and Its Application to Healthcare Settings
   1. Waste and Time
   2. Value Stream Mapping
   3. Process Improvement/Kaizen
2. Understand Use of Simulation Modeling
   1. Model Development
   2. Model Verification and Validation
   3. What-if Analysis

**Readings:**

*Required:*

Santos, Flávio Roberto Souza dos, & Cabral, Sandro. (2008). FMEA and PMBOK applied to project risk management. JISTEM - Journal of Information Systems and Technology Management, 5(2), 347-364

Tenrninko J. Reliability/Mistake-proofing Using Failure Mode and Effect Analysis (FEMA). Quality Congress. 2003, 57

*Supplementary***:**

Reid, D. FEMA – Something Old, Something New. Quality Congress. 2005; 38, 5.

## 

## Session 7: Case Study: Mental Health Services in Kenya

**Ian Kanyanya**

**Learning Objectives:**

1. To describe mental health services in Kenya

2. To understand the complexities involved in implementing and evaluating mental health interventions in Kenya

**Readings:**

Bitta, M. A., Kariuki, S. M., Chengo, E., & Newton, C. (2017). An overview of mental health care system in Kilifi, Kenya: results from an initial assessment using the World Health Organization's Assessment Instrument for Mental Health Systems. *International journal of mental health systems*, *11*, 28. doi:10.1186/s13033-017-0135-5

 Jenkins, R., Othieno, C., Okeyo, S., Aruwa, J., Kingora, J., & Jenkins, B. (2013). Health system challenges to integration of mental health delivery in primary care in Kenya--perspectives of primary care health workers. *BMC health services research*, *13*, 368. doi:10.1186/1472-6963-13-368

 Kumar, M., Huang, K. Y., Othieno, C., Wamalwa, D., Madeghe, B., Osok, J., Kahonge, S. N., Nato, J., … McKay, M. M. (2017). Adolescent Pregnancy and Challenges in Kenyan Context: Perspectives from Multiple Community Stakeholders. *Global social welfare : research, policy & practice*, *5*(1), 11-27

Supplementary readings

<https://www.ncbi.nlm.nih.gov/books/NBK321108/>

Kenya Mental Health Policy 2015 - 2030 [Internet]. [cited 2018 Jan 10]. Available from: <http://publications.universalhealth2030.org/ref/e5ab9a205fdbd7c811bb895d09e4f81c>

## Session 8: Quality Improvement as a Management Tool

**John Wanyungu**

**Learning Objectives:**

1. Define how quality improvement can be used to identify and test innovations in the health care setting
2. Demonstrate how quality improvement has facilitated broad scale-up of health programs

**Readings:**

*Required:*

Quality Improvement Made Simple: What everyone should know about healthcare quality improvement. By Health Foundation. 2nd edition (2013)

Quality Improvement Handbook: A Guide for Enhancing the Performance of Health Care Systems (2017)

*Supplementary:*

The Handbook of Quality and Service Improvement Tools. NHS-Institute for Innovations and Improvement.

[Quality Improvement Guide - Health Quality Ontario](http://www.hqontario.ca/portals/0/Documents/qi/qi-quality-improve-guide-2012-en.pdf)

Quality Improvement. US Department of Health and Human Services. Health Resources and Services Administration (HRSA). 2011.

Quality Improvement (QI) in Primary Health Centers. Operation Manual for Field Testing and Country adaptation. WHO. 1st edition. 2008.

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## Session 9: Stakeholder Analysis and Policy Analysis

**Peter Nguhiu**

**Learning Objectives:**

1. Describe the stages of policy development and how empirical information can be used at each stage
2. Identify and map key stakeholders in a policy issue

**Readings:**

*Required:*

Alonge, O., Rodriguez, D. C., Brandes, N., Geng, E., Reveiz, L., & Peters, D. H. (2019). How is implementation research applied to advance health in low-income and middle-income countries? *BMJ Global Health*, *4*(2), e001257.

Chemouni, B. (2018). The political path to universal health coverage: power, ideas and community-based health insurance in Rwanda. *World Development*, *106*, 87-98.

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## Session 10: Social Marketing and Dissemination Research

**Sylvia Opanga and Ann Musuva**

**Learning Objectives:**

1. Understand the process of developing an effective marketing strategy
2. To discuss the need for dissemination research and describe the roles that researchers play in dissemination

**Readings:**

*Required:*

Harris JR, Cheadle A, Hammon PA, Forehand M, Lichiello P, Mahoney E, Snyder S, Yarrow J. A Framework for disseminating evidence-based health promotion practices. *Prev Chronic Dis* 2012; 9:110081.

US Dept of Health and Human Services, National Cancer Institute, Theory at a Glance: A guideline for health promotion practice

*Supplementary:*

Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organisations: a systematic review and recommendations. *Milbank Q.* 2004;82 (4) :581-629.

Damschroder LJ et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implementation science: IS. 2009; 4:50.

Glasgow RE et al. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. American journal of public health. 1999;89(9):1322-7.

Wandersman A et al. Bridging the gap between prevention research and practice: the interactive systems framework for dissemination and implementation. American journal of community psychology. 2008;41(3-4):171-81.

## 

## Session 11: Organizational Readiness for Change

**Bryan Weiner**

**Learning Objectives:**

**Readings:**

Shea, C. M., Jacobs, S. R., Esserman, D. A., Bruce, K., & Weiner, B. J. (2014). Organizational readiness for implementing change: a psychometric assessment of a new measure. *Implementation Science: IS*, *9*, 7.

Weiner, B. J. (2009). A theory of organizational readiness for change. *Implementation Science: IS*, *4*, 67.

Weiner, B. J. (2007). A theory of organizational readiness for change: what we know, what we think we know, and what we need to know. *Implementation Science*

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## Session 12: Case Study: Improving Access and Quality of ANC and Delivery Services

**Anne Pulei**

**Learning Objectives:**

1. To understand the rationale of scaling up antenatal care and facility delivery as a strategy to improve maternal and infant outcomes
2. To describe the complexities involved in designing, implementing, and evaluating maternal health interventions in Kenya

**Readings:**

*Required:*

Lozano, R., et al., Progress towards Millennium Development Goals 4 and 5 on maternal and child mortality: an updated systematic analysis. The Lancet, 2011. 378(9797): p. 1139-1165.

*Supplementary:*

Koblinsky, M., et al., Going to scale with professional skilled care. The Lancet, 2006. 368(9544): p. 1377-1386.

Campbell, O.M.R. and W.J. Graham, Strategies for reducing maternal mortality: getting on with what works. The Lancet, 2006. 368(9543): p. 1284-1299.

Simkhada, B., et al., Factors affecting the utilization of antenatal care in developing countries: systematic review of the literature. Journal of Advanced Nursing, 2008. 61(3): p. 244-260.

Zanconato, G., et al., Antenatal care in developing countries: The need for a tailored model. Seminars in Fetal and Neonatal Medicine, 2006. 11(1): p. 15-20.

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## Session 13: Case Study: Male Circumcision for HIV Prevention in Kenya

**Kenneth Serem**

**Learning Objectives:**

1. To understand the evidence base for the association between male circumcision and reduced risk for acquisition of HIV infection
2. To describe the complexities involved in designing, implementing and evaluating a national program to scale up male circumcision services in Kenya

**Readings:**

*Required*

Bailey RC, Moses S, Parker CB, et al. Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial. Lancet 2007; 369:643-56.

*Supplementary*

WHO, U. (2016). A framework for voluntary medical male circumcision: effective HIV prevention and a gateway to improved adolescent boys’ and men’s health in eastern and southern Africa by 2021. *Geneva: World Health Organization*.

Kenya National Voluntary medical Male circumcision strategy 2014/15-2018/19

Westercamp M, Jaoko W, Mehta S, Abuor P, Siambe P, Bailey RC. Changes in Male Circumcision Prevalence and Risk Compensation in the Kisumu, Kenya Population 2008-2013. J Acquir Immune Defic Syndr. 2016 Sep 13. [Epub ahead of print] PubMed PMID: 27632232.

Kripke K, Njeuhmeli E, Samuelson J, Schnure M, Dalal S, Farley T, Hankins C, Thomas AG, Reed J, Stegman P, Bock N. Assessing Progress, Impact, and Next Steps in Rolling Out Voluntary Medical Male Circumcision for HIV Prevention in 14 Priority Countries in Eastern and Southern Africa through 2014. PLoS One. 2016 Jul 21;11(7): e0158767.

Kripke K, Reed J, Hankins C, Smiley G, Laube C, Njeuhmeli E. Impact and Cost of Scaling Up Voluntary Medical Male Circumcision for HIV Prevention in the Context of the New 90-90-90 HIV Treatment Targets. PLoS One. 2016 Oct 26;11(10): e0155734.

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## Session 14: Case Study: HPV Vaccine Introduction for Cervical Cancer Prevention in Kenya

**Nelly Mugo**

**Learning Objectives:**

1. To understand and articulate the evidence base for HPV vaccine as a tool to prevent cervical cancer and related issues for its introduction as a national program
2. To describe the complexities involved in designing, implementing and evaluating the introduction of HPV vaccine for cervical cancer prevention in Kenya

**Readings:**

*Required:*

LaMontagne, S, et al. Human papillomavirus vaccine delivery strategies that achieved high coverage in low- and middle-income countries*. Bull WHO* 2011; 89:821.

CDC. Progress Toward Implementation of Human Papillomavirus Vaccination — the Americas, 2006–2010. *MMWR* 2011; 60: 1382.

*Supplementary:*

Garland S, et al. Adolescent and young adult HPV vaccination in Australia: achievements and challenges. *Prev Med*. 2011; 53 (Suppl 1): S29 -S35.

Lu B, et al. Efficacy and Safety of Prophylactic Vaccines against Cervical HPV Infection and Diseases among Women: A Systematic Review & Meta-Analysis. *BMC Infect Dis* 2011; 11:13.

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## Session 15: Diabetes Control in Kenya

**Zachary Muriuki**

**Learning Objectives:**

1. To become familiar with the epidemiology and burden of Diabetes in Kenya
2. Learn about approaches to program scale up with an explicit commitment to achieving health impact

**Readings:**

Kenya National Diabetes Comprehensive Care Manual, Manual for Health Care Workers 2010

Kenya National Clinical Guidelines for The Management of Diabetes Mellitus 2018

Kenya National diabetes strategy 2010 - 2015

Kenya National guidelines for Healthy Diets and physical activity 2017

Kenya National Strategy for the Prevention and Control of Non-Communicable Diseases. Republic of Kenya Ministry of Health 2015-2020.

World Health Organization. Noncommunicable diseases progress monitor 2017

<https://bmcpublichealth.biomedcentral.com/articles/supplements/volume-18-supplement-3>.

## Session 16: Course Synthesis

**Bryan Weiner, Judith Wasserheit**

**Learning Objectives:**

1. Justify the need for an implementation science framework and summarize its main attributes
2. Apply appropriate public health methods and strategies to develop and implement successful, large-scale public health programs

# APPENDIX 1: Pre-course Questions

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| **PLEASE ANSWER THIS QUESTION AT THE BEGINNING OF THE IMPLEMENTATION SCIENCE MODULE** |

The Afya Bora Fellowship is dedicated to helping trainees develop understanding around implementation science and health systems research further informing their capacity to facilitate successful program implementations/interventions. What is your understanding of those factors which contribute to implementation success? Failure? Please provide your confidential answer in the box below; take as much space as you need.

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| **PLEASE ANSWER THIS QUESTION AT THE END OF THE IMPLEMENTATION SCIENCE MODULE** |

Has the Fellowship helped to clarify and illustrate the skills needed for effective intervention development, implementation and scale-up? How? Has the Fellowship helped to focus or enhance your understanding of what is required for successful program interventions? How? Please provide your confidential answer in the box below; take as much space as you need.

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# APPENDIX 2: Lecturer Bios

Kennedy K.Serrem,

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Kennedy Serrem is a Technical advisor and project coordinator- Partners for Health and Development in Africa, Nairobi, Kenya. Responsible for providing technical and managerial support to NASCOP VMMC program both at national and regional level. Responsibilities include; Provision of technical guidance to the national program through the National TWG and the office of national program manager on sustenance of VMMC program and Member of senior management team. Serrem has also been the Ag Country Director and HIV prevention program manager for Catholic Medical Mission Board among other responsibilities.

George Makari

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Eng Dr. George Nyori Makari is a senior Lecturer, a researcher, Author, and a Consultant in the regional leading University, the university of Nairobi in the department of Mechanical and Manufacturing Engineering. He holds a PhD in Manufacturing Engineering, Msc in Mechanical Engineering and a Bsc in Mechanical Engineering. He also holds a diploma in Organizational leadership. Dr Nyori Graduated from the University of Nairobi in 1990 and Joined the industry for 3 years rising to a research and development Engineer before rejoining the University for further studies. He has since furthered his studies, taught, researched and consulted in Industrial Engineering, Operation Research, Gas Dynamics, Engineering Economics among others. He is a specialist in Advanced Manufacturing Technology Management. He is a Registered Engineer with the Engineers Registration Board of Kenya and a Member of the Institution of Engineers of Kenya. He has published several publications and he is currently a reviewer in an international Science index journal and also a member of the Scientific and Technical Committee & Editorial Review Board of Industrial and Manufacturing Engineering in World Academy of Science, Engineering and Technology.

Anne Pulei

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Ms. Anne Naipanoi Pulei, BSc, MBChB, MSc, MMed (Ob/Gyn), is a lecturer in the Departments of Human Anatomy and Obstetrics & Gynecology at the University of Nairobi (UoN), Kenya. She joined the UoN in 2011 as a tutorial fellow. Since then she has published over 20 peer-reviewed original articles. She completed her Master of Medicine at the UoN in 2017, her thesis looked at the role of micronutrient deficiencies and the occurrence of preeclampsia. Anne also participates in clinical duties and research at the Kenyatta National Hospital, the teaching hospital for UoN. Anne has worked closely with Prof. Scott McClelland and Dr. John Kinuthia, her primary research mentors, as a consultant for the Microbiota and Preterm Birth (MPTB) Study

Peter Nguhiu,

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Peter is a pharmacist and a health economist with 12 years of work experience of increasing technical and coordination responsibility. For his PhD, he is investigating the contribution of health financing reforms at national and county level, to the level and distribution of effective coverage of health services in Kenya. Peter has an excellent grasp of econometric analysis and modelling based on large, complex household / facility survey datasets and routinely reported health data.

Serah Ngugi

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Serah Ngugi is an Afya Bora alumna and currently works with the Ministry of Health in Nyandarua County as a Consultant Paediatrician and a Senior Assistant Director of Medical Services. She attained her Bachelor of Medicine and Surgery degree (MBchB) and a Master of Medicine degree (M.med) in Paediatrics and Child Health from the University of Nairobi. Her vision is to see children in Kenya and Africa not only survive but thrive in order to develop into productive members of the society. She has a passion for Maternal, Newborn and Child Health (MNCH) implementation science. She supports county health facility managers and healthcare providers in scaling up and evaluating the coverage of cost-effective, high impact MNCH interventions to improve health outcomes. Serah also has an interest in clinical epidemiology and is currently a doctoral student in epidemiology at the Jomo Kenyatta University, Kenya.

Nelly Mugo, MBChB, MMeD, MPH

Senior Research Scientist, KEMRI

Lecturer, University of Nairobi

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Dr. Mugo has 25 years of experience as a reproductive health specialist working from rural district facilities to the National teaching hospital. In the last 14 years, the majority of her work has shifted to research with a focus on reproductive health and HIV prevention clinical research. The majority of Dr. Mugo’s research activities has been in clinical research, specifically working on Pelvic Inflammatory Disease, cervical cancer prevention and HIV prevention. For the last 10 years, her work has concentrated on HIV prevention working with HIV-serodiscordant couples. Working in collaboration with the International Clinical Research Center (ICRC), University of Washington, and other African research teams, she has completed two landmark multisite clinical trials, HSV-HIV transmission study and the Partners PrEP study, in addition to several observational related studies.

Dr. Mugo is an honorary lecturer at the University of Nairobi, where she teaches both undergraduate and post graduate students in the department of obstetrics & gynaecology, the clinical epidemiology unit and provide clinical services at the cervical cancer colposcopy clinic.

She currently leads a research team in Thika, Kenya and works as a senior research scientist at the National research institute (KEMRI), where she heads the sexual reproductive and adolescent child health research program.

Zachary Muriuki

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Zachariah Ndegwa Muriuki is a National Program Officer at the Ministry of Health, Kenya. coordinating diabetes prevention and control activities in Kenya. He holds a Bachelor of Science Degree in Foods, Nutrition and Dietetics. He is currently undertaking a Master’s in Public Health (Monitoring and Evaluation) at Kenyatta University, Kenya.

Zachariah Ndegwa has been involved in policy development and research in diabetes. He has also led several initiatives focusing on diabetes education, capacity building of health care workers, development of national clinical guidelines for the management of diabetes and advocacy at the national level.

He has also been involved in overseeing the running of several diabetes projects in Kenya, among them is the National project dubbed Mainstreaming and Expanding National Diabetes Comprehensive Care in Kenya, the Changing Diabetes in Children project (CDiC) and the Base of Pyramid Project (BOP) that were aimed at building the capacity of health care systems in prevention, diagnoses and management of diabetes mellitus, increasing the access of insulin to children living with type 1 diabetes and building the capacity of faith based facilities in Kenya.

Ruth Nduati, MBChB, MMED, MPH

Professor, Department of Paediatrics & Child Health, University of Nairobi

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Ruth Nduati, MBChB, MMed, MPH is a Professor of Paediatrics and a specialist in Paediatric Infectious Disease with extensive experience in PMTCT, scientific leadership, health policy and training. She has been instrumental in translating research findings in the field of PMTCT into policy, enabling Kenya to have one of the most successful national PMTCT programs in sub-Saharan Africa. The Kenyan program is known for being responsive to evidence and this has resulted in a significant reduction in the rate of MTCT between 2003 to 2019. Ruth Nduati has led multiple clinical trials including initial studies that characterized the transmission of HIV through breastmilk1 and later the Kesho Bora study (Kenyan site) which evaluated triple therapy for PMTCT4. The findings of the Kesho Bora directly informed international PMTCT guidelines and resulted in more efficacious PMTCT regimens. In the UoN MEPI program, Ruth Nduati was responsible for the decentralized research which supported over 400 undergraduate students in medicine, nursing, pharmacy and dentistry to undertake short-term clinical exposures in 18 non-tertiary sites distributed across Kenya. The students received mentorship by local specialists and participated in micro-projects that addressed priority areas of the respective facilities. Recently Ruth Nduati and her colleague competitively won an award HEPI whose main aim is to create a pipeline for training physician and clinical scientists.

Anne Njoroge

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Dr. Anne Njoroge is a medical doctor and a public health specialist working as the Project Director, ITECH-Kenya; where her focus is public health evaluation and health systems strengthening. She assists CDC-funded HIV care & treatment partners design and conduct program evaluations and utilize their findings for program improvement. She also manages their GAVI-funded Electronic Vaccine Registry project. She’s a part-time lecturer with the University of Nairobi, teaching graduate students in UNITID (Epidemiology -Research Methodology) and School of Pharmacy (Biostatistics).

Anne is interested in ways of leveraging existent HIV programs to integrate non-communicable disease (NCD) care; particularly diabetes and cardiovascular disease. She was a recipient of the International AIDS Research & Training Program scholarship for her MPH at the University of Washington in 2014, where her research focused on assessing for cardiovascular disease risk factors among HIV-infected individuals. She’s a PhD candidate in the Implementation Science program at the University of Washington currently working on her dissertation, having successfully completed her coursework in Seattle.

<https://globalhealth.washington.edu/education-training/phd-gh/student-profiles>

Anne Musuva

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Dr. Anne Musuva is the Chief Operating Officer at Population Services Kenya. Her role involves oversight and strategic direction of all programs at PS Kenya. These include social marketing a portfolio of health products, oversight of a social health franchise with over 400 private health facilities and social behaviour change communication programs. She is a medical doctor and a seasoned public health professional with experience working in the public and private health sectors. Dr Anne has led the design and scale up of health programs in Kenya in HIV, Malaria, maternal health, Child health and nutrition. She previously worked for the Ministry of Health as a District Medical Officer of health and for the Institute of Tropical Medicine in Belgium on Drug Resistant TB.

Dr Musuva also currently serves as a member of the University Council of the Institute of Tropical Medicine in Belgium. Dr Anne is the conference chair of the Africa Social & Behaviour Change conference, which was held in Nairobi in 2019 attracting over 550 participants from 25 countries. Dr Musuva has received various global health awards. In 2016 she was recognized by Health Systems Global (HSG) as one of 50 *Emerging Voices (EVs)* in Global Health and has also been recognized by the World Health Summit in Berlin as a *New Voice in Global Health*. Dr. Musuva was also recognized in 2017 by Business Daily as a *Top 40 under 40* finalist. She holds a MSc in Public health- Disease Control from the Institute of Tropical Medicine in Antwerp, Belgium and a bachelor’s degree in medicine and Surgery from the University of Nairobi. She has also participated in short courses from the London School of African and Oriental Studies (SOAS) and the University of Washington.

Sylvia Opanga, PhD

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Sylvia Opanga is Clinical Pharmacist and a Senior Lecturer at the University of Nairobi’s School of Pharmacy. She holds a PhD in Clinical Pharmacy from the University of Nairobi She practices at Kenyatta National Hospital and her main areas of interest are Surgical, Cardiovascular and Infectious disease pharmacotherapy. She runs her own Pharmacotherapy clinic where she provides medication therapy management services. She holds a fellowship in Implementation Science from the University of Washington, Seattle, and subsequent to that, trains the Afya Bora Global Health Leadership Fellowship on Implementation Science. Evidence based clinical practice is also her core area of interest. She has conducted several systematic reviews and meta-analyses that have impacted policy, mostly on antibiotic use in Kenya. She is a member of the Ministry of health antimicrobial stewardship technical working group, and she heads the community pharmacy sector for this group. Sylvia is a founder member of the International Society of Pharmacoepidemiology (Africa Chapter) and is the East African regional Lead. She also belongs to the Medicines Utilisation and Research Group in Africa (MURIA). She a member of the Pharmaceutical society of Kenya, the Hospital Pharmacists association of Kenya, founder assistant secretary for the Kenya Society for Basic and Applied Pharmacology and an associate member of the Surgical Society of Kenya.

John Wanyungu, MSc

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John Wanyungu holds a Master’s Degree in Community Health from the University of Liverpool, United Kingdom and advanced training in Quality Improvement from the National Quality Center, New York State Department of Health plus Health Systems Management from the National Institute of Public Health of Japan. John works at the Ministry of Health (K) Headquarters as part of the Health Sector Coordination Secretariat.

Prior to moving to MoH Hqs (Afya Hse) in early 2015, John worked at the National AIDS Control Program (NASCOP) for seven years where he held the position of the National Quality Improvement Manager since October 2009. John led the process of developing the current National HIV Quality Improvement Framework, Operational Manual and Training materials (2014) which are currently being used to train HCWs countrywide in Quality Improvement.

Additionally, John is a National CQI Trainer/Coach and UoN HIV Fellowship Mentor in the Quality Management Medium Term Fellowship Program. He has participated widely in building capacity of County Health Management Teams in Quality Improvement through training and mentorship programs. Currently, John is involved in the roll-out of Differentiated Care Model in HIV clinics in Kenya using CQI methods and capacity building of county health management in the four pilot UHC counties in the country.

John has attended several local and international conferences on Quality Improvement in New York, Paris, London, Johannesburg, Kampala, Dar es Salam, Windhoek, among other cities where he has made presentations on quality improvement work in Kenya.

Judith Wasserheit, MD, MPH

Chair, Department of Global Health, University of Washington

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Judith N. Wasserheit MD, MPH is currently Professor of Medicine and Global Health and Chair of the Department of Global Health at the University of Washington in the Schools of Medicine and Public Health & Community Medicine. She is also an Affiliate Investigator the Fred Hutchinson Cancer Research Center. She was formerly the Director of the HIV Vaccine Trials Network, a NIH-funded global clinical trials platform linking 28 sites on 4 continents in evaluating preventive HIV vaccines. She has had extensive experience in sexually transmitted disease (STD) research, policy development and program implementation both in the United States and in developing countries. Her research has included one of the first laparoscopic studies of pelvic inflammatory disease etiology conducted in the US, the first population-based study of the prevalence and etiologic spectrum of STDs among rural women in the Indian Subcontinent, and research on the interrelationships between STDs and contraceptive practices in other parts of the developing world, including Indonesia, and Egypt. She has also worked in Columbia, Thailand and Zambia. Her development of the concept of epidemiological synergy between HIV infection and other STDs has had a major influence on HIV prevention policy and programs around the world.

From 1989 to 1992, Dr. Wasserheit led the development of the newly established STD Research Branch at the National Institute of Allergy and Infectious Diseases (NIAID), where she shaped a robust multidisciplinary national research agenda that launched the STD Cooperative Research Centers (CRCs), which continue to be a major part of the Institute’s STD research portfolio today. She directed the Centers for Disease Control and Prevention’s national STD Prevention Program from 1992 to 2001, where she led the development and implementation of STD prevention policy guidance for state and local health department programs, and related research in epidemiology, clinical services, behavioral science, surveillance and program evaluation. These initiatives included the establishment of this country’s National Chlamydia Prevention Program and the National Syphilis Elimination Plan that dramatically reduced syphilis among African Americans. Dr. Wasserheit has extensive experience working successfully with national and international agencies, governments, and colleagues on STD and HIV research, policy and programmatic issues. She has led or served on numerous World Health Organization and UNAIDS committees and advisory groups.

Dr. Wasserheit received her BA from Princeton University, her MD from Harvard Medical School, and her MPH from the Johns Hopkins University. During her Infectious Disease research fellowship at the University of Washington from 1982-84, she helped establish the Refugee Clinic at Harborview Medical Center, a clinic that continues to operate today as the HMC International Medicine Clinic. She is a member of the editorial board for Sexually Transmitted Diseases, a fellow of the American College of Physicians and the Infectious Disease Society of America and a member of the American Public Health Association and the American Sexually Transmitted Diseases Association. Her honors include the Young Professional Award of the Maternal-Child Health Section of the American Public Health Association, the Presidential Meritorious Rank Award of the Department of Health and Human Services, the Edward E. Kass Award Lecture of the Infectious Diseases Society of America, the American STD Association's Achievement Award, and the American Social Health Association’s Presidential Award. In 2006, Dr. Wasserheit was elected to the Institute of Medicine of the National Academies. In 2007, she was selected as a Paul Rogers Society Global Health Research Ambassador, in 2008 was selected for the founding class of the Washington State Academy of Sciences, and in 2009 was honored as the London School of Hygiene and Tropical Medicine’s Heath Clark Endowed Lecturer. From 2012 to 2014, she was Chair of the Board of Directors of the Consortium of Universities for Global Health.

Bryan Weiner, PhD

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Bryan is Professor in the Departments of Global Health and Health Services at the University of Washington. Dr. Weiner’s research focuses on the implementation of innovations and evidence-based practices in healthcare. Over the past 23 years, he has examined a wide range of innovations including quality improvement practices, care management practices, and patient safety practices; as well evidence-based clinical practices in cancer and cardiovascular disease. His research has advanced implementation science by creating knowledge about the organizational determinants of effective implementation, developing new theories of implementation, and improving the state of measurement in the field.

Mary Schmitz

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Maryis an Epidemiologist with the Centers for Disease Control and Prevention (CDC), Division of Global HIV & TB (DGHT), based in Nairobi, Kenya.   Ms. Schmitz’ work at CDC has spanned M&E, research, surveillance, and program management.  Some of her projects include development of the Kenya HIV-Exposed Infant Cohort Analysis system, evaluation of use of dried-blood spots for viral load monitoring, development of Kenya’s HIV quality improvement framework, and supporting HIV bio-behavioral surveillance among fishing communities and within a general population Health and Demographic Surveillance System (HDSS) in Western Kenya.  Currently Ms. Schmitz’ primary focus is supporting HIV recency surveillance among antenatal clinic attendees in selected counties of Kenya and rollout of national HIV recency surveillance. She also is a member of the National HIV Case Based Surveillance Technical Working Group.

 Prior to her work with CDC, Ms. Schmitz worked for international non-governmental organizations on HIV, nutrition, and primary health care projects primarily in Kenya, Malawi, and South Sudan.  She earned her Bachelor’s degree in Biochemistry and Anthropology from Marquette University (Milwaukee, USA) and her Master’s of Public Health from Johns Hopkins University (Baltimore, USA).

Ian Kanyanya MBChB, MMed

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Dr Ian Kanyanya is a Senior Psychiatrist at Kenyatta National Hospital and Honorary Lecturer, Department of Psychiatry University of Nairobi. He is also a Honorary Lecturer Department of Psychiatry, Mathare Mental Hospital. He trained at the University of Nairobi for his undergraduate and postgraduate and has a certificate in refugee Trauma and Recovery from Harvard University. He is the Head of Department of Mental Health at Kenyatta National Hospital since 2018**.**His interests are in management of children with developmental, emotional, behavioural and mental disorders.

APPENDIX 3: Bibliography

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APPENDIX 4: Acknowledgements

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