SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

McGill | Summer Institutes in Global Health

Reimagining Implementation Science in the Global South

Grace Umutesi, PhD, MPH
gumutesi@uw.edu

Materials adapted from Bryan J. Weiner, PhD; Gabrielle O'Malley, PhD, MA; Anjuli Wagner, PhD, MPH; and Coco Alarcon, PhD

Reimagining Global Health

W

What to expect during this session

My job

- Teach with words and pictures that help you understand new concepts
- Give examples
- Answer your questions
- Facilitate the session
- Be open to new ideas
- Learn from YOU!

Your job

- Alert me if I am talking too fast or slow, using words you don't understand, or need to clarify
- Ask questions often!
  - Raise hand function
  - Off mute speak
  - Chat function
- Participate in activities
- Learn from each other!

LET'S HEAR FROM YOU

What do you know about "Implementation Science"?

ie when you hear IS what comes to mind?

LET'S HEAR FROM YOU

What is your expectation for this session?

ie what do you hope to get from our time together?

LET'S HEAR FROM YOU

Is there anything in particular you would like us to address during this session?

AGENDA

- What is Implementation Science?
- What does “evidence-based intervention” mean?
- What are “implementation outcomes”?
- Distinction between discovery science and implementation science
- Case study: HPV vaccination
- Reimagining Implementation Science in our settings
- Q & A

WHY IS?

17 years to translate clinical innovations into practice

50% of clinical innovations ever make it into general usage

80% of medical research dollars do not make a public health impact for various reasons

Mosteller (1981), Balas and Boren (2000), Grant et al. (2003), Morris et al. (2011), Chalmers and Glasziou (2009), Bauer (2020)

GLOBAL KNOW-DO GAP

Coverage estimate	Global	African Region
Anemia, women, 15-49 years	30%	40%
Births by skilled health personnel	83%	65%
Measles vaccination	71%	33%
ARVs for advanced HIV infection	67%	70%

https://cdn.who.int/media/docs/default-source/gho-documents/world-health-statistic-reports/2021/whs-2021_20may.pdf?sfvrsn=55c7c6f2_18
https://data.worldbank.org/indicator/SH.HIV.ARTC.ZS

WHAT IS IMPLEMENTATION SCIENCE?

Not something between research and implementation

Not research with poor rigor

WHY IS?

Implementation science asks and answers the fundamental question:

How do we get what **works** to people with greater **quality, speed, fidelity, efficiency,** and relevant **coverage?**

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How do we get what **works** to people with greater **quality, speed, fidelity, efficiency,** and relevant **coverage?**

IMPLEMENTATION SCIENCE MADE SIMPLE

What is implementation research and how does it differ from effectiveness research?

Examples:

Training, audit and feedback, opinion leaders clinical reminders, decision support, task shifting

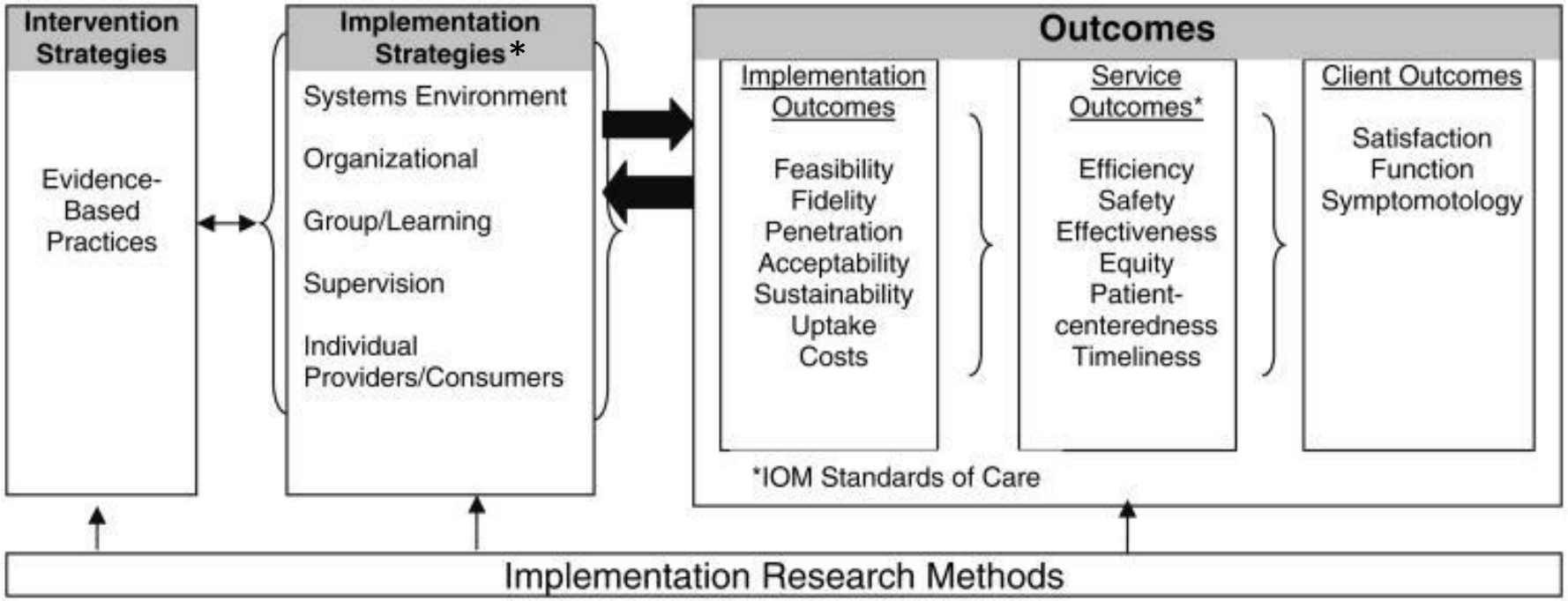
% clinicians delivering EBP, % patients receiving EBP, guideline adherence, competence

EVIDENCE BASED	PROGRAMS, PRACTICES, PRINCIPLES, PROCEDURES, PRODUCTS, PILLS, POLICIES = THE THING
Effectiveness Research	Whether THE THING **works**
Implementation Research	**Studying** how to best help people and places **do** THE THING
Implementation Strategies	The **stuff we do** to try to help people and places **do** THE THING
Main Implementation Outcomes	**How much** and **how well** they **do** THE THING

Adapted from: Curran, G.M. Implementation science made too simple: A teaching tool. *Implement Sci Commun* 1, 27 (2020). https://doi.org/10.1186/s43058-020-00001-z

Content credit: Dr. Bryan Weiner

TERMINOLOGY MATTERS IN ALL SCIENCES, INCLUDING IS



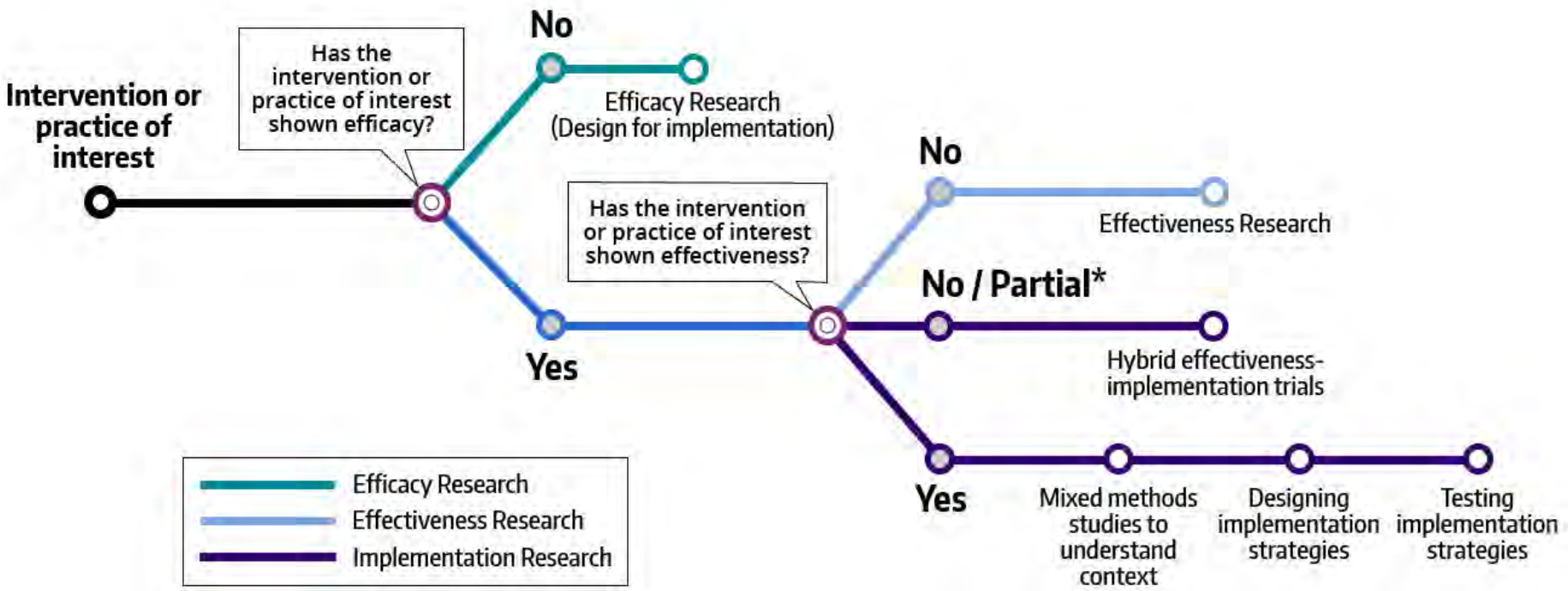
**Strategies can also be framed differently in other fields (eg: policy analysis, etc)*

Proctor et al, 2008, Admin & Pol in Mental Health Services

Implementation Outcomes

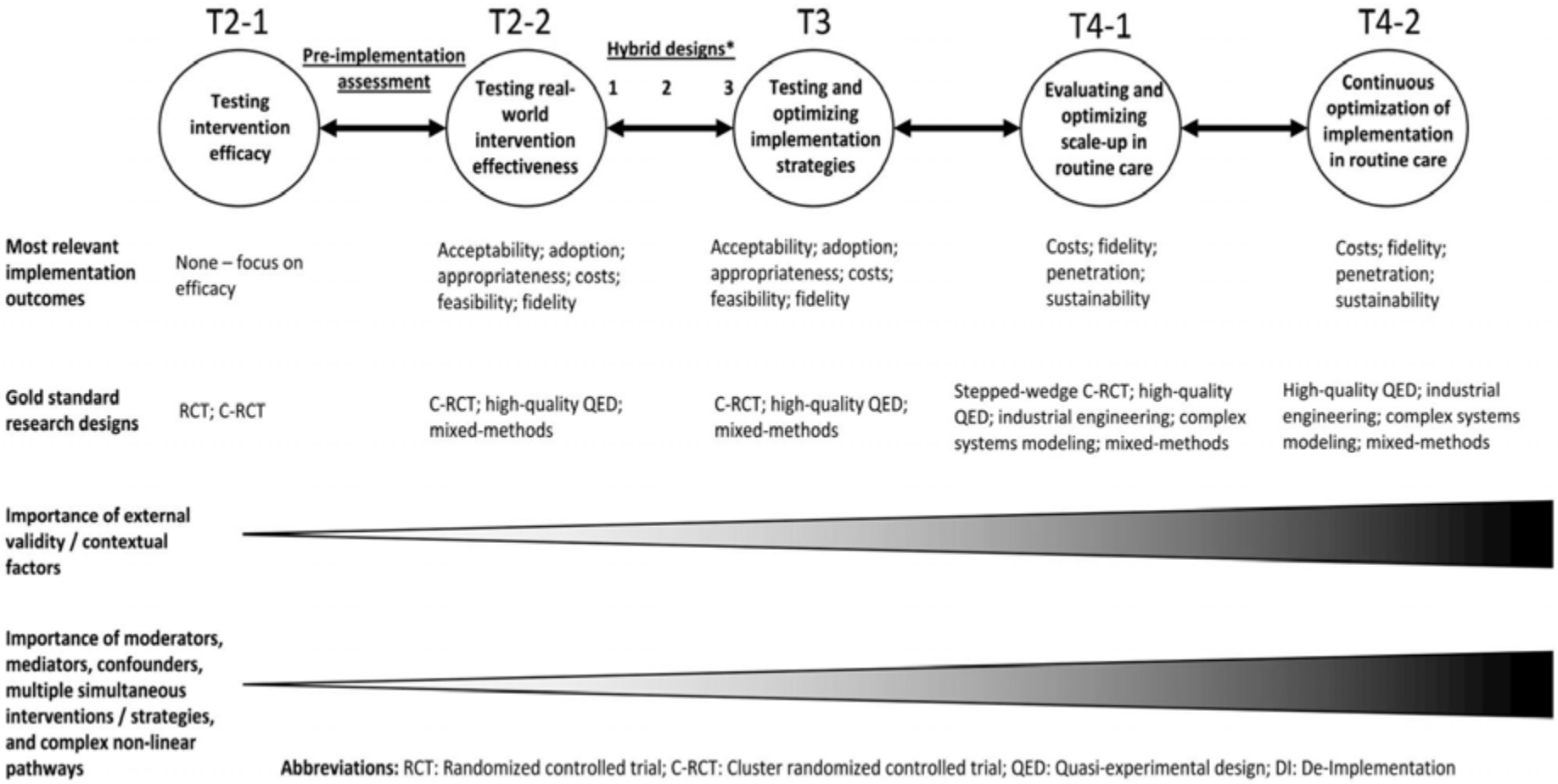
Acceptability	Perception that a treatment, service, practice, or innovation is agreeable or satisfactory
Adoption	Intention, initial decision, or action to try or employ an evidence-based practice, from the perspective of provider or organization
Appropriateness	Perceived fit, relevance, or compatibility of the evidence-based practice for a practice setting, provider, or consumer
Cost	Depends upon the costs of the intervention, the implementation strategy used, and the location
Feasibility	Extent to which an innovation can be successfully used or carried out
Fidelity	Degree to which an intervention was implemented as it was prescribed in the protocol or as it was intended by the developers
Penetration	Integration of a practice within a service setting and its subsystems
Sustainability	Extent to which an innovation is maintained or institutionalized within a service setting's ongoing, stable operations

WHERE IS YOUR SCIENCE IN THE CONTINUUM?



Adapted from Lane-Fall, M.B., Curran, G.M. & Beidas, R.S. Scoping implementation science for the beginner: Locating yourself on the "subway line" of translational research. *BMC Med Res Methodol* 19, 133 (2019). https://doi.org/10.1186/s12874-019-0783-z
Source: https://impsciuw.org/implementation-science/research/frame-your-question/

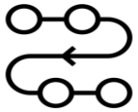
TRANSLATION RESEARCH – MORE GRANULAR



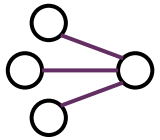
Credit: Dr. Brad Wagenaar

IS FRAMEWORKS

There are 60+ implementation science frameworks, including:



Process frameworks: inform the phases and stages needed for translating research into practice



Determinants frameworks: identify factors that influence implementation effectiveness

Evaluation frameworks: evaluate the impact of implementation

Frameworks are used to **systematically** approach a question.
Inference is **deepened** by linking, contrasting, and comparing to existing scientific knowledge

IS & HEALTH EQUITY

- IS has the **potential to improve strategies to achieve health equity**
- Leverage IS' **multidisciplinary tools to interrogate contextual layers** (Odeny B, 2021)
  - TMFs, implementation strategies, implementation outcomes and pragmatic research designs

- 3 steps to break the cycle of inequity
  - Systematically **sparse and understand layers of inequity**
  - Identify **strategies to improve equity**
  - Generate **metrics to quantify and monitor disparities** and track progress

PLOS MEDICINE

PERSPECTIVE

Closing the health equity gap: A role for implementation science?

Beryne Odeny *

PLOS Medicine, San Francisco, California, United States of America

* bodeny@plos.org

WHO defines health equity as "the absence of unfair and avoidable or remediable differences in health among population groups defined socially, economically, demographically, or geographically or by other means of stratification" [1]. Yet, contrary to this fundamental aspiration and the international mandate on universal health coverage (UHC), almost 50% of the world's population does not receive needed health services, and progress toward health equity remains elusive [2].

Equity in clinical research

In a new study published in *PLOS Medicine*, Muthukumar and colleagues address underrepresentation of minority populations, a pressing equity issue in clinical research. In a systematic analysis of ClinicalTrials.gov, the authors investigated the frequency of English language requirement in interventional United States (US) clinical trial eligibility criteria [3]. Of 14,367 trials registered from January 2019 to December 2020, approximately one fifth specified language requirements. They found that approximately 19% (n = 2,727) of clinical trials required English language proficiency, while approximately 3% (n = 390) had accommodations for

OPEN ACCESS

Citation: Odeny B (2021) Closing the health equity gap: A role for implementation science? PLoS Med 18(9): e1003762. https://doi.org/10.1371/journal.pmed.1003762

Published: September 14, 2021

Case Study: HPV Vaccination

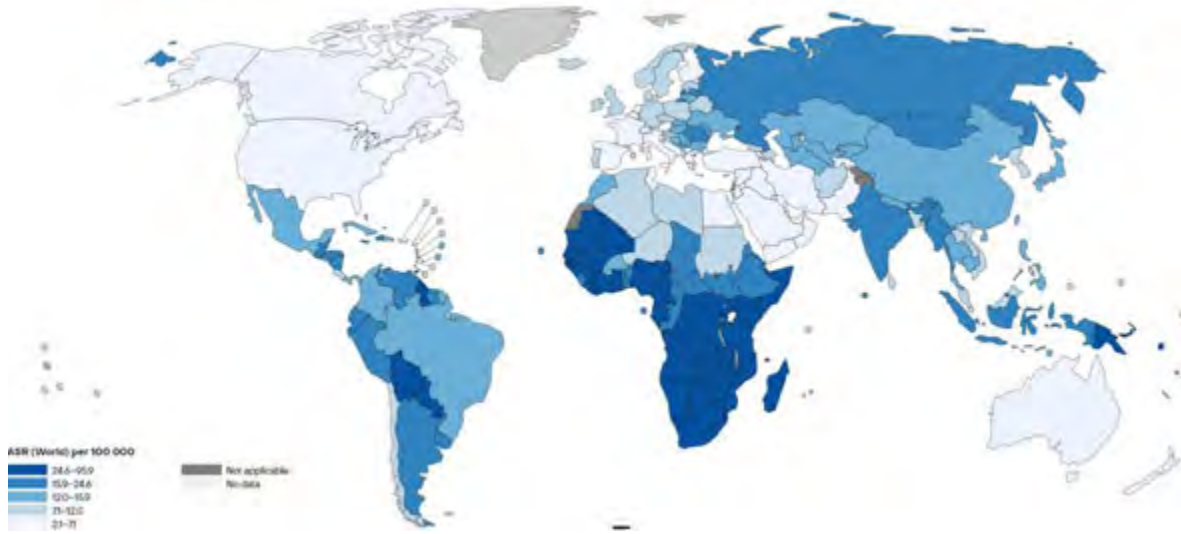
Source: WHO, International Agency for Research on Cancer

THE PROBLEM

- Cervical cancer is the **4th most common cancer among women** worldwide

- Persistent high-risk human papillomavirus (**hr-HPV**) infections cause **~95% of cervical cancer cases**

- Low-and- middle income countries (LMICs) bear the **greatest burden** of cervical cancer incidence and mortalities



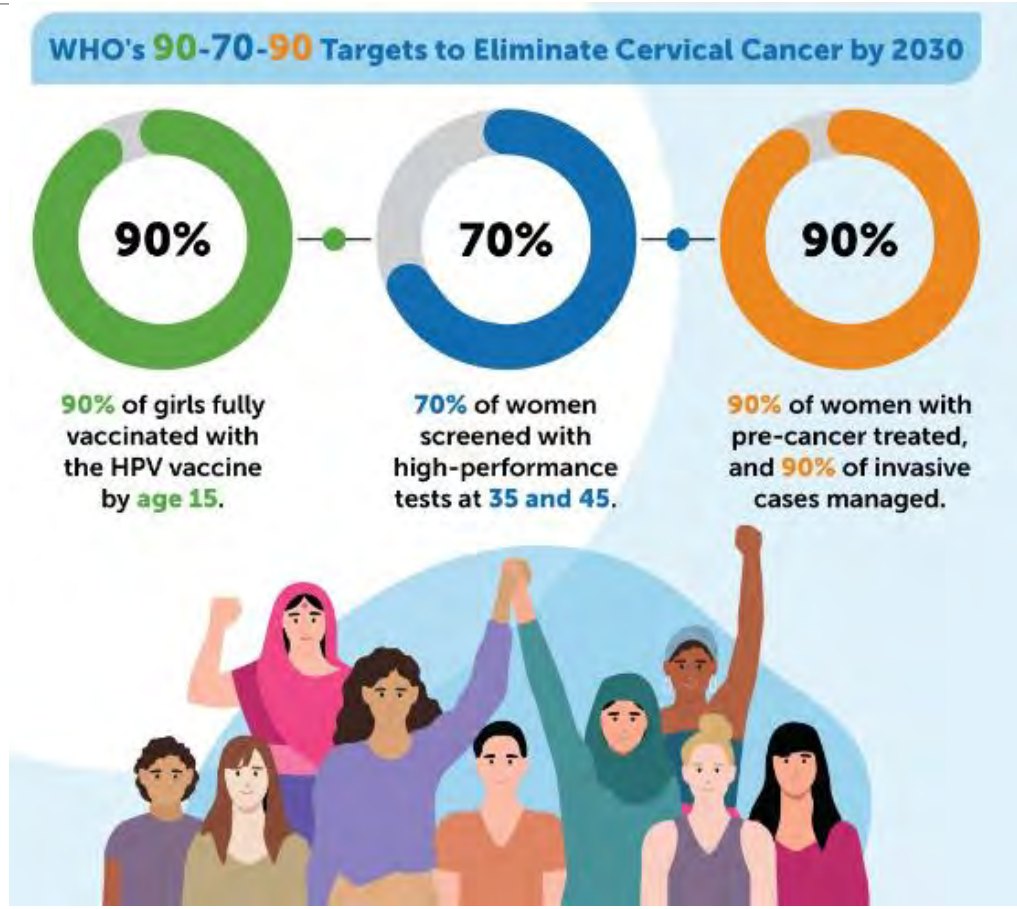
Age-standardized incidence rate of cervical cancer (per 100,000) in 2022 (source: GLOBOCAN)

THE PROBLEM

- In 2018, the World Health Organization (WHO) issued a call to **eliminate cervical cancer as a public health problem by 2030**

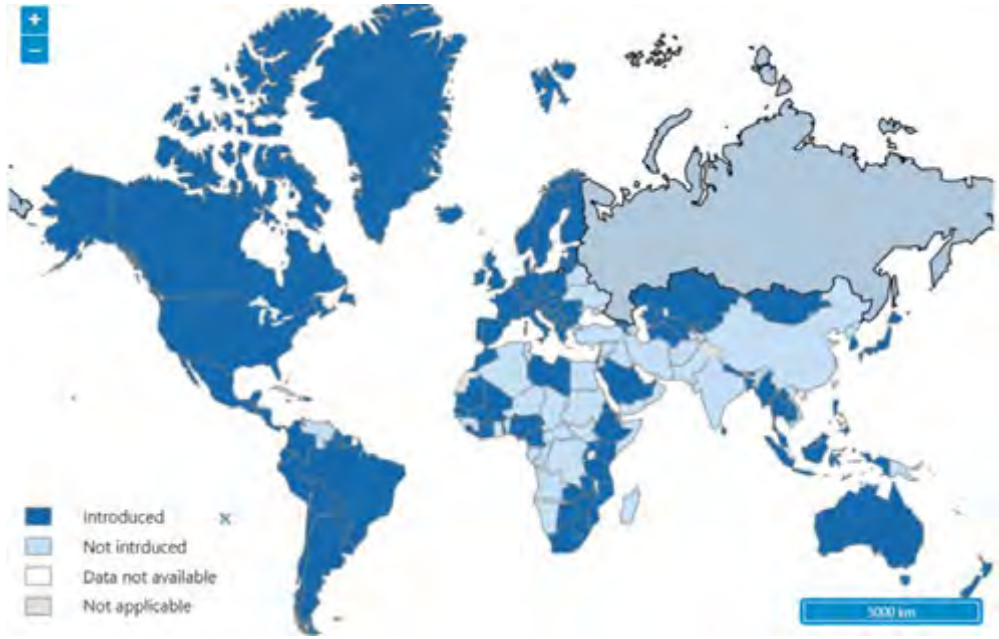
- **Three targets** were set for countries to achieve cervical cancer elimination

- Cervical cancer elimination is defined as having **<u>≤</u>4 new cases annually per 100,000 women**



PILLAR 1: HPV VACCINATION

- **HPV vaccines** are **safe and highly effective** in preventing cervical cancer
- **Coverage remains low** globally
- In 2023, **only 20% of girls had received their first dose** of HPV vaccination by age 15
- HPV vaccination is **yet to be introduced in 46 countries**



HPV Vaccine Introduced in National Immunization Programs (Source: WHO)

SINGLE-DOSE HPV VACCINATION


HPV WORLD

ONE DOSE - year 1 No. 17-26

Newsletter on Human Papillomavirus - www.hpvworld.com

Single-dose efficacy using the quadrivalent HPV vaccine. Early findings from an Indian study

Rengaswamy Sankaranarayanan, MD
Anurja Bhatla, MBBS, MD
Bhagwan M Nene, MD, FRCP
Partha Basu, MD

Global vaccine uptake and projected cervical cancer disease reductions

Lala Brand, MD, MPH, PhD

Perspectives on accelerating HPV vaccines toward impact

Peter Dull, MD

Can we use one dose of HPV vaccine to ensure long term protection?

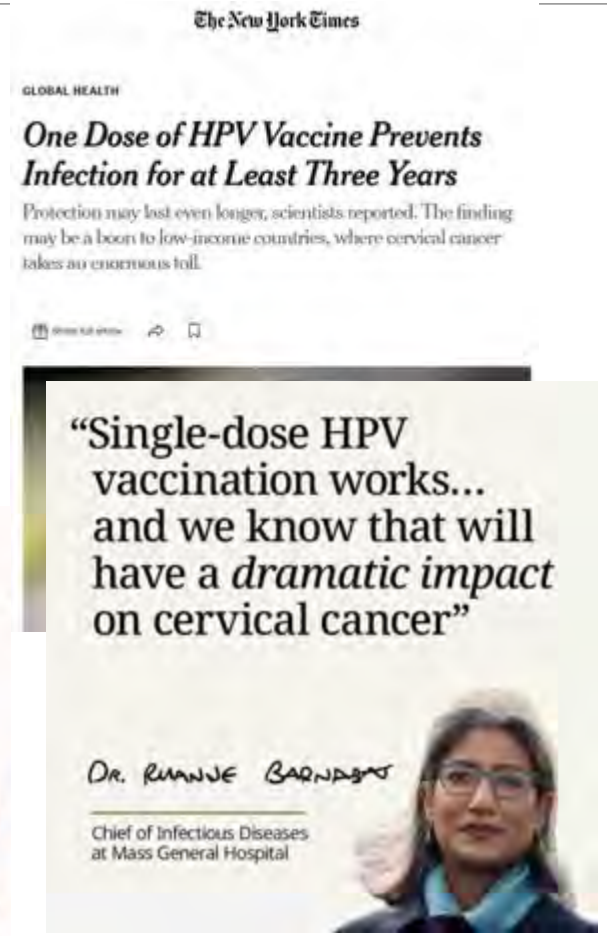
INTERVIEW WITH

Almin R. Kreimer, PhD

Two doses of the HPV vaccines administered 6- to 12-months apart is the current recommendation for adolescents. What makes you think a single dose look at the efficacy of the HPV vaccines by number of doses received. We did this first in the Costa Rica HPV Vaccine Trial (CVT), which tested the bivalent HPV

mint Premium

Single-dose HPV jab is enough to prevent cervical cancer, Indian study finds


The New York Times

GLOBAL HEALTH

One Dose of HPV Vaccine Prevents Infection for at Least Three Years

Protection may last even longer, scientists reported. The finding may be a boon to low-income countries, where cervical cancer takes an enormous toll.

"Single-dose HPV vaccination works... and we know that will have a *dramatic impact* on cervical cancer"

DR. RUANJE BARNARD

Chief of Infectious Diseases at Mass General Hospital


World Health Organization
Ethiopia

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The human papillomavirus (HPV) single-dose schedule elevated the total number of vaccinated girls in Ethiopia to over 13 million

17 January 2025

PAHO

One-dose Human Papillomavirus (HPV) vaccine offers solid protection against cervical cancer

CBC

Top Stories | Local | Climate | World | Canada | Politics | Indigenous

Health

Canada's vaccine advisers now recommend 1 dose of HPV shot for younger groups

England, Ireland, Scotland, Wales and Australia have already made switch to fewer doses

BENEFITS OF SINGLE-DOSE HPV VACCINATION

More convenient for caregivers/girls

Fewer expenses related to immunization

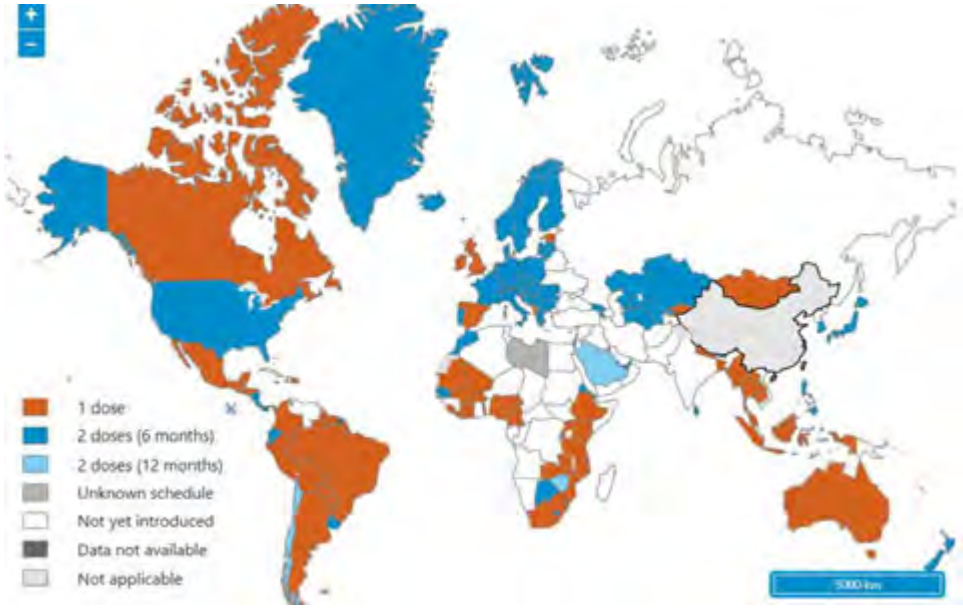
Reduced time burden for healthcare workers

Fewer outreach visits to schools

Reduced catch-up activities

Less time commitment for other key stakeholders e.g. teachers

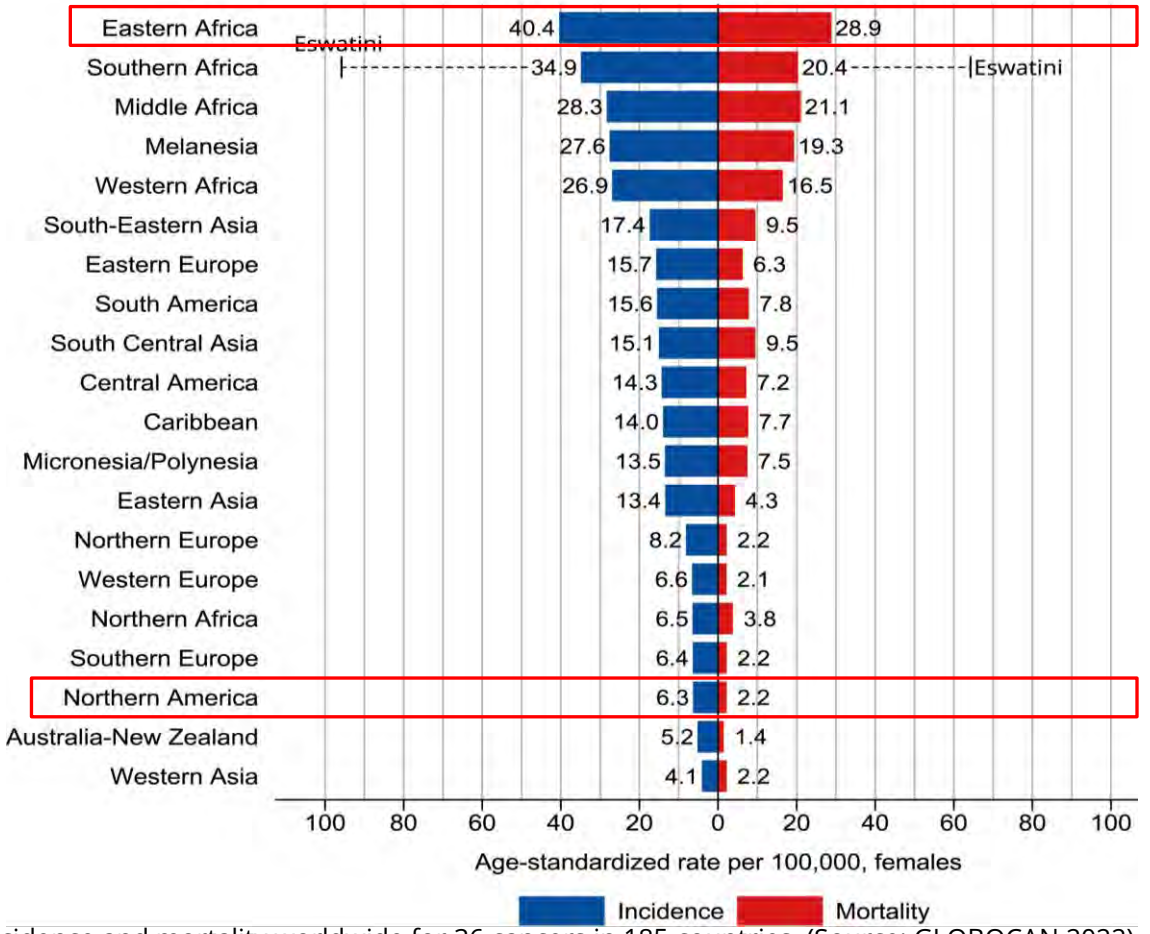
Potential program benefits of a single-dose HPV vaccination schedule
(Source: Gavi, HPV Vaccine Schedule Optimization, 2023)



HPV Vaccination Schedule (9-14 years old)
(Source: WHO)

THE PROBLEM

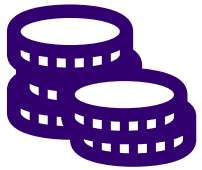
- In East Africa, cervical cancer causes the highest number of cancer-related deaths among women
- In Kenya, 9 women lose their lives to cervical cancer each day
- HPV vaccination program launched in 2019 targeting 10-year-old girls with a two-dose schedule
- In 2021, coverage was 77% for the first dose and 31% for the second dose



Incidence and mortality worldwide for 36 cancers in 185 countries (Source: GLOBOCAN 2022)

KEN SHE IS Project

Acceptability of the single-dose schedule among healthcare providers (HCPs) in Kenya



Potential health and economic impact of switching to a single-dose schedule in Kenya

Framework policy analysis to assess "the how" of policy revision on HPV vaccination in East Africa

ACCEPTABILITY OF SINGLE-DOSE HPV VACCINATION

- **Constructs of acceptability** were **not correlated** or **associated with** the **acceptability reported** by HCPs
- **A single-dose HPV vaccination was acceptable** to most HCPs
- HCPs reported **gaps in knowledge** on the SD schedule
- Some HCPs were **concerned with potential moral consequences,** but **most thought** that it was **fair**
- Acceptability of the SD schedule **was lower** among HCPs in
  - **urban settings** compared to those in **rural settings**
  - **higher referral levels** compared to those **lower referral levels**

OXFORD

Journal of the National Cancer Institute Mon

Acceptability of single-dose HPV vaccination schedule among health-care professionals in Kenya: a mixed-methods study

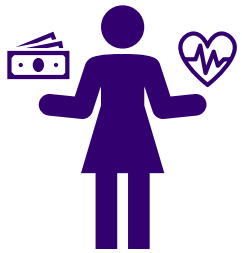
Grace Umutesi, MPH, ICDP,[1,2] Bryan J. Weiner, PhD,[1,3] Lynda Oluoch, MBChB, MPH,[2,4] Elizabeth Bukusi, MBChB, MMED, PhD, MPH,[2,4] Mariciannah Ohotho, MBChB, MS, PhD,[2] Betty Njiroge, MBChB, MPH,[2] Lucy Mecca, MBChB,[5] Kenneth Ngure, PhD, MSc, MPH,[1,6] Nelly R. Mugo, MBChB, MMED, MPH,[1,2,4] Ruanne V. Barnabas, MBChB, MSc, DPhil[1,3,7,8]

Abstract

Background: The World Health Organization recommends a single-dose human papillomavirus (HPV) vaccination schedule for girls and boys to accelerate progress toward cervical cancer elimination. We applied the Theoretical Framework of Acceptability (TFA) within the context of HPV vaccination to assess the acceptability of a single-dose schedule among health-care professionals in Kenya.

Methods: A REDCap survey was developed using relevant Theoretical Framework of Acceptability domains and validated with health-care professionals. Descriptive analyses and multivariate Poisson regression were conducted to assess factors associated with increased acceptability. Free-text responses were analyzed using a rapid qualitative approach, and findings were presented using a joint display.

POTENTIAL IMPACT OF SINGLE-DOSE HPV VACCINATION



- **Impact of switching to a single-dose schedule, assuming no waning efficacy of single-dose**
- **Impact of switching to a single-dose, assuming waning efficacy of single-dose**
- **Potential cost savings from switching to a single-dose schedule and impact of using cost-savings to fund supplemental catch-up or gender-neutral HPV vaccination**

IMPACT OF SUPPLEMENTAL VACCINATION

5-year cost savings from all potential transitions

Lowest cost saving

2-dose schedule	**1-dose schedule**
2-dose, 70% coverage	1-dose, 90% coverage

US $ 21.4 Million

Total cost of vaccination: $7.77 per vaccination*

*Mean discounted total cost of vaccination

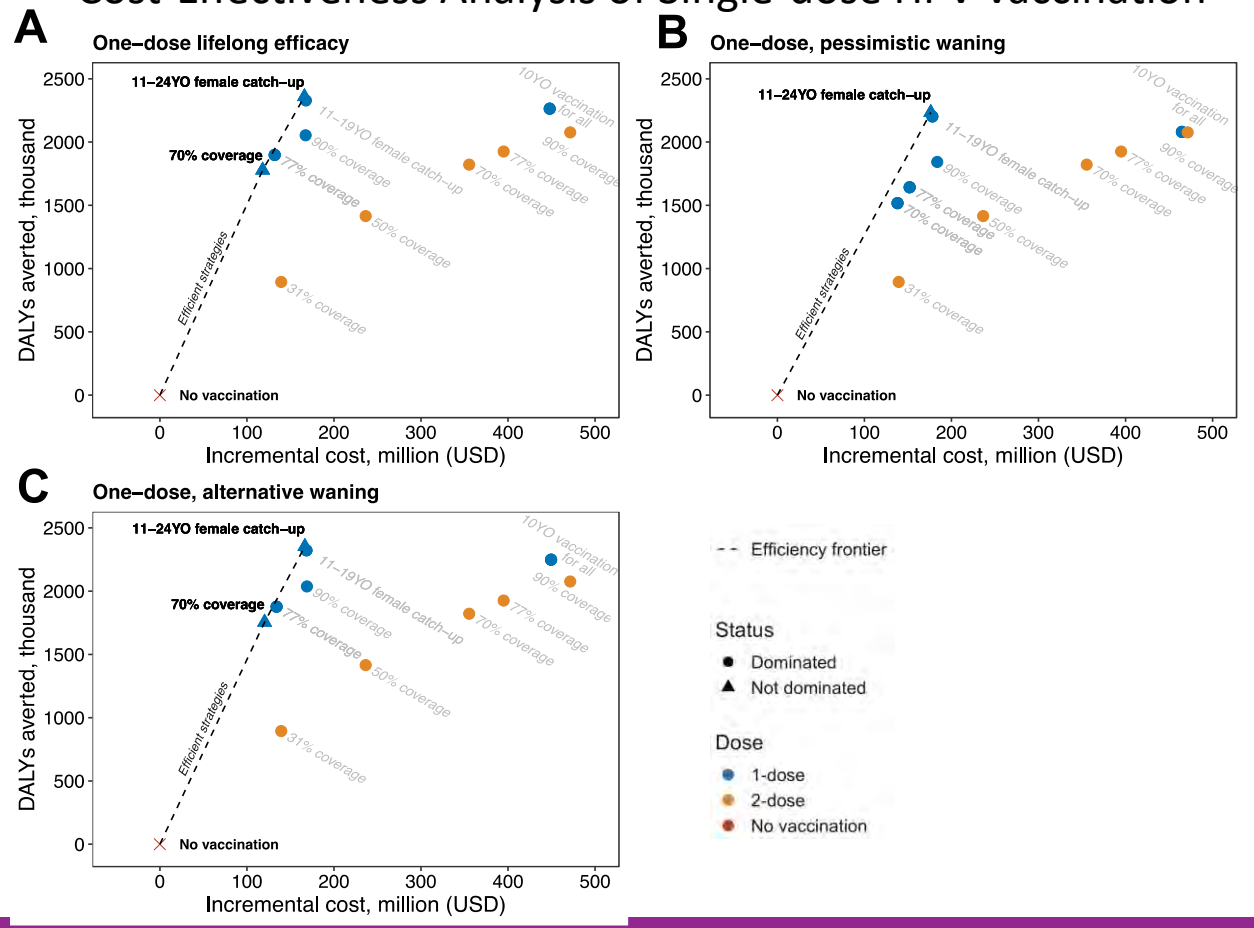
2.75 million additional HPV vaccinations

IMPACT OF SINGLE-DOSE HPV VACCINATION

- **Single-dose** schedule is **more cost-effective than** the **two-dose** schedule **regardless of uncertainty around waning efficacy** of single-dose

- **Supplementing a single-dose HPV vaccination for 10-YO** girls **with a catch-up vaccination for 11-24 YO** girls and young women **is the most efficient approach** across doses and durability assumptions

Cost-Effectiveness Analysis of Single-dose HPV vaccination



IMPACT OF SUPPLEMENTAL VACCINATION

vaccines

Article

The Potential Impact of a Single-Dose HPV Vaccination Schedule on Cervical Cancer Outcomes in Kenya: A Mathematical Modelling and Health Economic Analysis

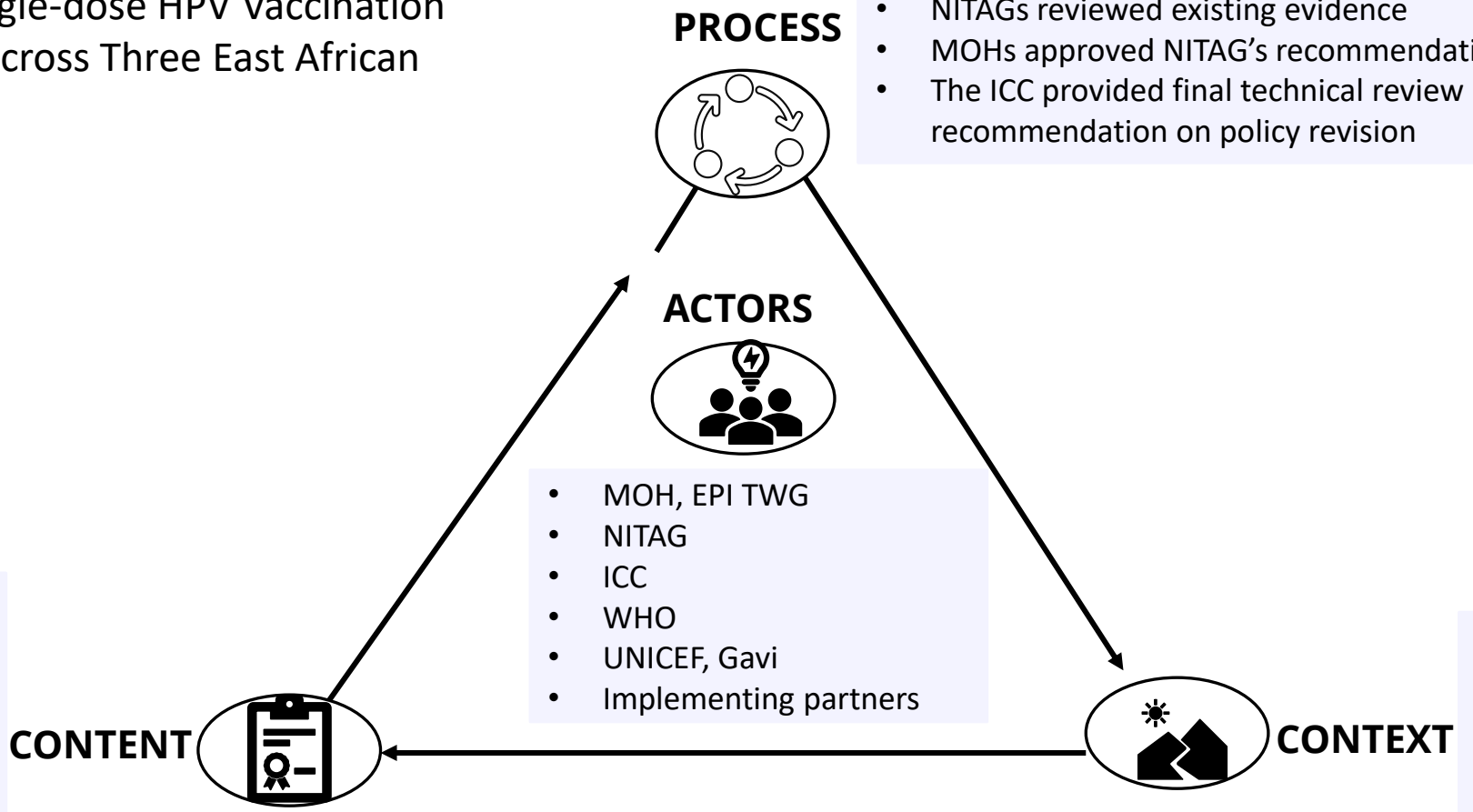
Grace Umutesi [1,*,†], Christine L. Hathaway [2,3,†], Jesse Heitner [2], Rachel Jackson [4], Christine W. Miano [5], Wesley Mugambi [5], Lydiah Khalayi [5], Valerian Mwenda [6], Lynda Oluoch [7], Mary Nyangasi [6], Rose Jalang'o [5], Nelly R. Mugo [1,7] and Ruanne V. Barnabas [2,8]

1 Department of Global Health, University of Washington, Seattle, WA 98105, USA
2 Division of Infectious Diseases, Massachusetts General Hospital, Boston, MA 02114, USA
3 University of Washington School of Medicine, Seattle, WA 98195, USA
4 The Norton College of Medicine, Upstate Medical University, Syracuse, NY 13210, USA
5 National Vaccines and Immunization Program, Ministry of Health, Nairobi P.O. Box 30016-00100, Kenya
6 National Cancer Control Program, Ministry of Health, Nairobi P.O. Box 30016-00100, Kenya
7 Kenya Medical Research Institute, Nairobi P.O. Box 19865-00202, Kenya
8 Department of Medicine, Harvard Medical School, Boston, MA 02115, USA
* Correspondence: gumutesi@uw.edu
† These authors contributed equally to this work.

Abstract: Background: Human Papillomavirus (HPV) is the primary cause of cervical cancer. Single-dose HPV vaccination can effectively prevent high-risk HPV infection that causes cervical cancer and accelerate progress toward achieving cervical cancer elimination goals. We modelled the potential impact of adopting single-dose HPV vaccination strategies on health and economic outcomes in Kenya, where a two-dose schedule is the current standard. **Methods**: Using a validated compart-

POLICY CONSIDERATIONS FOR SINGLE-DOSE ADOPTION

Policy Analysis of Single-dose HPV Vaccination schedule Adoption Across Three East African Countries



- WHO recommended the single-dose (SD) schedule
- NITAGs reviewed existing evidence
- MOHs approved NITAG's recommendations
- The ICC provided final technical review and ratified MOH's recommendation on policy revision

- MOH, EPI TWG
- NITAG
- ICC
- WHO
- UNICEF, Gavi
- Implementing partners

- WHO recommendations
- National cancer control plans
- Cervical cancer prevention and control plans

- Strong political will was crucial
- Global vaccine shortage limited vaccine availability

POLICY CONSIDERATIONS FOR SINGLE-DOSE ADOPTION

- The **WHO recommendation** and the availability of **strong evidence on the benefit of single-dose** HPV vaccination played an **important role in the policy revision process**

BUT…

- **Strong political will, NITAGs** and the **growing burden of cervical cancer** in the region **catalyzed policy revision processes**

IMPLICATIONS

Account for the perspective of stakeholders from LMICs when developing implementation science frameworks to **ensure their relevance to LMICs**

Increase the knowledge on single-dose among HCPs **at all levels of the HS** which will **translate into increased uptake**

Leverage a **single-dose** schedule **to increase HPV vaccination coverage** and ensure **an efficient use of resources**

Foster **strong local technical expertise** for a **timely evaluation** of **evidence** to **guide policy**

JNCI

JNCI MONOGRAPHS

State of the Science of Single-Dose Prophylactic HPV Vaccination

academic.oup.com/jncimono

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Guest Editors:
Aimée R. Kreimer, PhD
Deborah Watson-Jones, PhD, BM BCh
Jane J. Kim, PhD
Peter Dull, MD

OXFORD
UNIVERSITY PRESS

Kenya switches to one dose of HPV vaccine to improve uptake

Friday, February 14, 2025

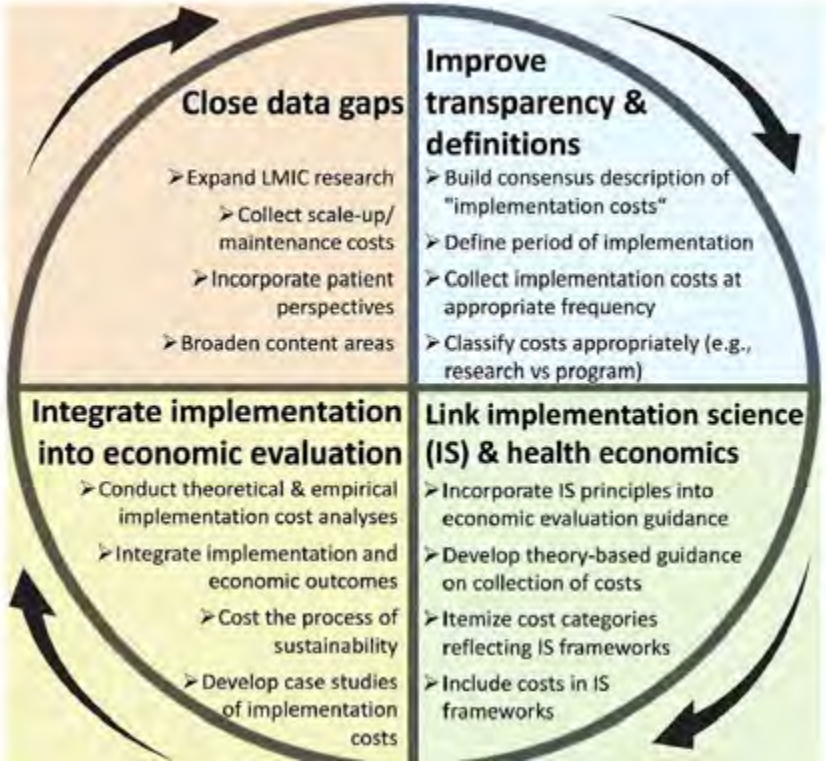
WHERE DO WE GO FROM HERE WITH IS?

HOW CAN WE REIMAGINE IS IN OUR SETTINGS?

- Improve the **representation of LMIC researchers** and **LMICs-informed methodologies** in IS

- Align IR/ IS with the
  - **demands of policymakers** and **program managers**, and
  - **needs of users** and **communities** (Sheikh K, 2020)

- Anchoring on health equity, use IS to **raise questions about the appropriateness of policies and program** especially in settings with underlying systemic issue (eg: power, politics and the dominance of particular narratives, etc)



Framework for improving implementation costing in LMICs
Malhotra, A., Thompson, R.R., Kagoya, F. *et al.* Economic evaluation of implementation science outcomes in low- and middle-income countries: a scoping review. *Implementation Sci* **17**, 76 (2022)

HOW CAN WE REIMAGINE IS IN OUR SETTINGS?

- Leverage IS to **recognize, understand and quantitatively monitor** inclusion and representation in global health research
- Prioritize **an intentional inclusion of voiceless communities**
  - ie whose voice did we capture and whose voice did we leave behind?
- **Prioritize community (local ownership)** and **true collaboration/ partnership**
- **Prioritize sustainability** from the initial/design phase
  - Account for social – political forces from the beginning
- **Push TMFs to address the issue of power, inequalities and reflexivity** (Snell-Rood C, 2021)
  - **Reflect on the role of power in knowledge production** and **how it researchers may perpetuate inequities**
  - **Think beyond one intervention,** expand partnerships/ initiative that address overlapping health issues and causes of vulnerabilities

WHAT WOULD IT LOOK LIKE IF WE REIMAGINED IS IN GLOBAL HEALTH?

- Which action should be taken?
- Who should be involved?
- How should it be done?
- When should this take place?
- Where should it be initiated, driven and operationalized?

APPENDIX

DEPARTMENT OF GLOBAL HEALTH