NTD AND IMMUNIZATION INTEGRATION: LITERATURE REVIEW

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March 15, 2021

Photo: Science Magazine

AGENDA

- Team Introductions
- Project Background
- Methodology
- Findings
- Recommendations
- Question and Answer

Photo: UN News

PROJECT TEAM

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START OVERVIEW

Leverages leading content expertise from across the University of Washington

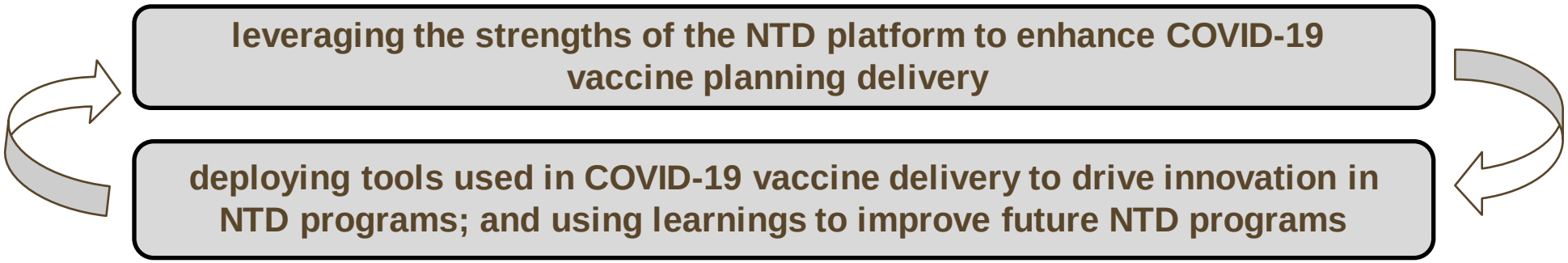
Provides high quality research and analytic support to the Bill & Melinda Gates Foundation and global and public health decision-makers

Provides structured mentorship and training to University of Washington graduate research assistants

PROJECT BACKGROUND

LEVERAGING THE NTD PLATFORM FOR COVID-19 VACCINE DELIVERY

A virtuous cycle:



LEVERAGING THE NTD PLATFORM FOR COVID-19 VACCINE DELIVERY

Community-based NTD programs have several strengths which could be leveraged to support COVID-19 vaccine delivery, including:

- Large reach, targeting 1 billion people; often nationwide implementation
- Targets underserved and hard-to-reach populations; routine immunization can be unequitable
- Implemented by trusted members of communities, such as trained community drug distributors (CDDs) supported by community leaders, and as such programs enjoys high community trust
- Hand and face hygiene is already part of NTD intervention strategies, and NTD behavior change messaging has already been adapted to promote hand and face washing to reduce the risks of COVID-19
- Demonstrated resilience during pandemic; postponements were typically short and resumed MDAs achieved high coverage
- Targets entire communities, including older populations, a priority group for vaccination; few other campaigns target older age groups, while older adults living in Africa have poor physical access to health facilities[1]
- Experience of working across national borders, e.g. trachoma and onchocerciasis working groups
- Prior experience of coordinating and integrating with immunization programs, leading to increased coverage of both programs, e.g. Tanzania, South Africa[2]

[1] Geldsetzer P et al. (2020). Mapping physical access to health care for older adults in sub-Saharan Africa and implications for the COVID-19 response: a cross-sectional analysis. Lancet Health Longevity 1, e32-e42.
[2] Mwingira UJ et al. (2016). Integrating Neglected Tropical Disease and Immunization Programs: The Experiences of the Tanzanian Ministry of Health. Am J Trop Med Hyg. 95:505-507. Verguet S, et al. (2013). Supplementary immunization activities (SIAs) in South Africa: comprehensive economic evaluation of an integrated child health delivery platform. Global Health Action. 6:20056

WHAT DOES INTEGRATION LOOK LIKE?

Annual plans to define national objectives; micro-planning to determine distribution down to the community

Includes both routine supervision of MDA implementation as well as additional M&E (e.g. impact assessments) completed annually which inform the following year's annual plan

Administration of drugs to population in rounds, community-based (generally LF, oncho, trachoma) or school-based (generally STH, schisto)

Distribution of necessary resources (e.g. registers, training materials, etc.) and drugs down through the supply chain to the community

Training of health workers and volunteer staff from national level to frontline community drug distributors and teachers

Deployment of mass media (TV, radio, billboards) at national/regional level and flyers, public announcements, etc. at community level to disseminate information and educate

WHAT DOES INTEGRATION LOOK LIKE?

Service Delivery

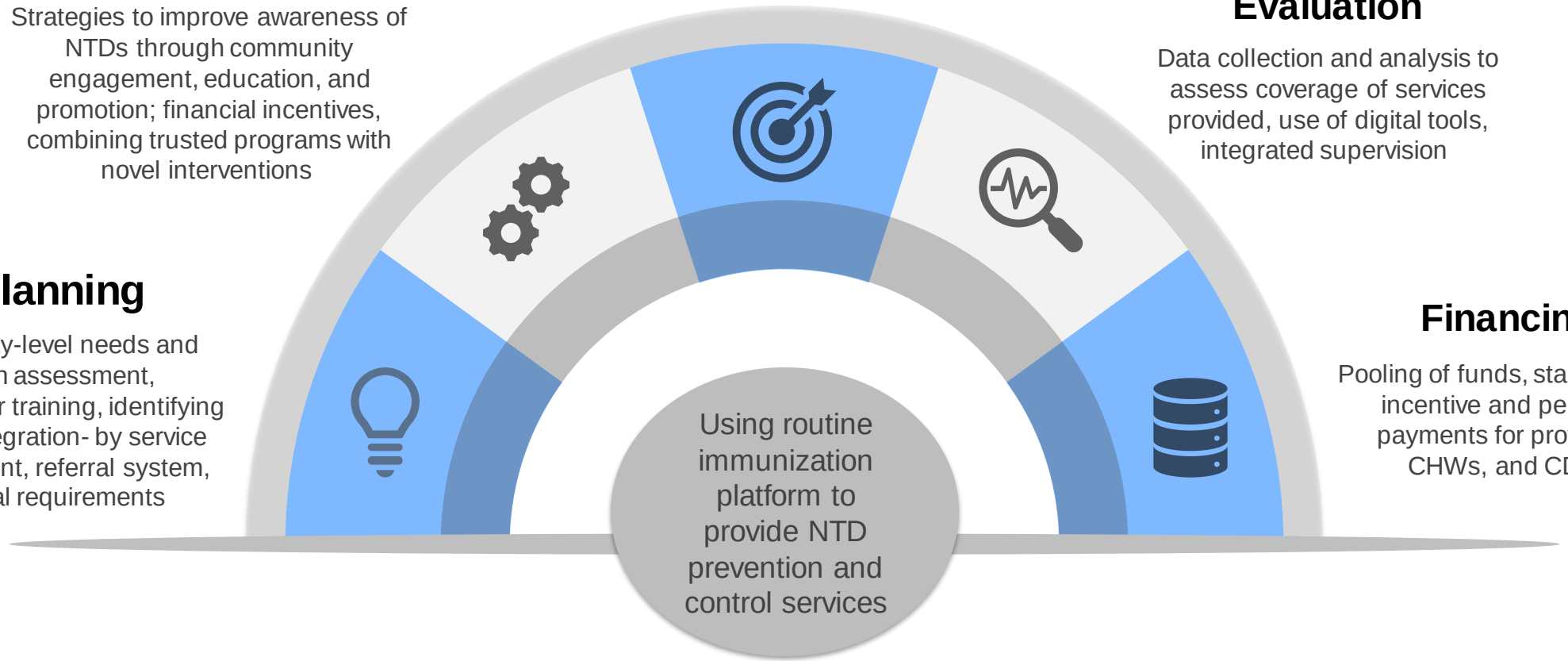
Sharing infrastructure and human resources, similar skill level health workers, procurement, supply chain management

Demand Generation

Strategies to improve awareness of NTDs through community engagement, education, and promotion; financial incentives, combining trusted programs with novel interventions

Monitoring & Evaluation

Data collection and analysis to assess coverage of services provided, use of digital tools, integrated supervision



Planning

Community-level needs and burden assessment, healthworker training, identifying type of integration- by service delivery point, referral system, logistical requirements

Financing

Pooling of funds, standardized incentive and per diem payments for providers, CHWs, and CDDs

Figure adapted from: Working together: an integration resource guide for immunization services throughout the life course. Geneva: World Health Organization; 2018. Licence: CC BY-NCSA 3.0 IGO.

START CENTER

DELIVERABLES

1. Compiled database of results from PubMed and Grey literature review, including abstracts and links to full text articles where available.

2. Presentation on (i) specific elements of NTD & immunizations campaigns that have been successfully integrated, (ii) benefits & challenges of integrating NTD and immunization campaign elements, and (iii) recommendations on how the NTD platform may be leveraged for the COVID-19 vaccination roll-out.

BENEFITS OF INTEGRATING CAMPAIGNS

- Treatment cost may be decreased on a per-person treated basis when compared to traditional vertical campaigns (Ex: Lao PDR deworming integration with Vitamin A)
- Logistical efficiencies from leveraging previous campaign infrastructure (Ex: health posts, cold chain and laboratory structures in Nigeria)
- Delivery of services by trusted CHWs from the community may increase uptake (Ex: Anganwadi workers delivering polio vaccine in India)
- Delivery of novel services alongside trusted interventions with easily visible benefits and aligned with community priorities may increase uptake (Ex: integrating polio vaccines with veterinary services in pastoralist communities in Ethiopia, integrating routine vaccination with deworming)

CHALLENGES OF INTEGRATING CAMPAIGNS

- Loss of campaign incentives for CHWs
- Increased waiting time for service distribution
- Logistical complexities of delivering multiple interventions with different time and material requirements (Ex: Liberia EPI staff)
- Potential overburdening of campaign staff due to the creation of parallel structures (Ex: Nigeria GPEI staff)

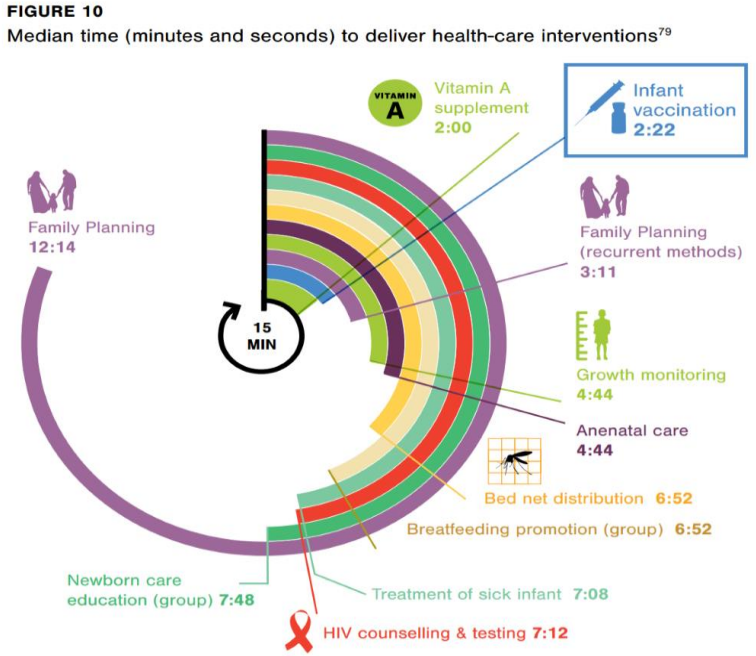


Figure adapted from Wallace et al, 2012.

"We have been doing Vitamin A and de-worming with polio. So, when you are doing your house-to house-strategy, if you are just administering the vaccine, which is the polio, you have a faster time to go...[***integration***] ***slows down the vaccinator movement. It is time-consuming if you have to administer all of them***...sometimes we work with the two-member teams when we are doing polio and ***sometimes we increase to add a member to speed up the work***. If we only have...two members, it is a challenge."

- Liberia, Supplemental Immunization Officer, EPI

Campaign Effectiveness Coalition: Findings from Liberia

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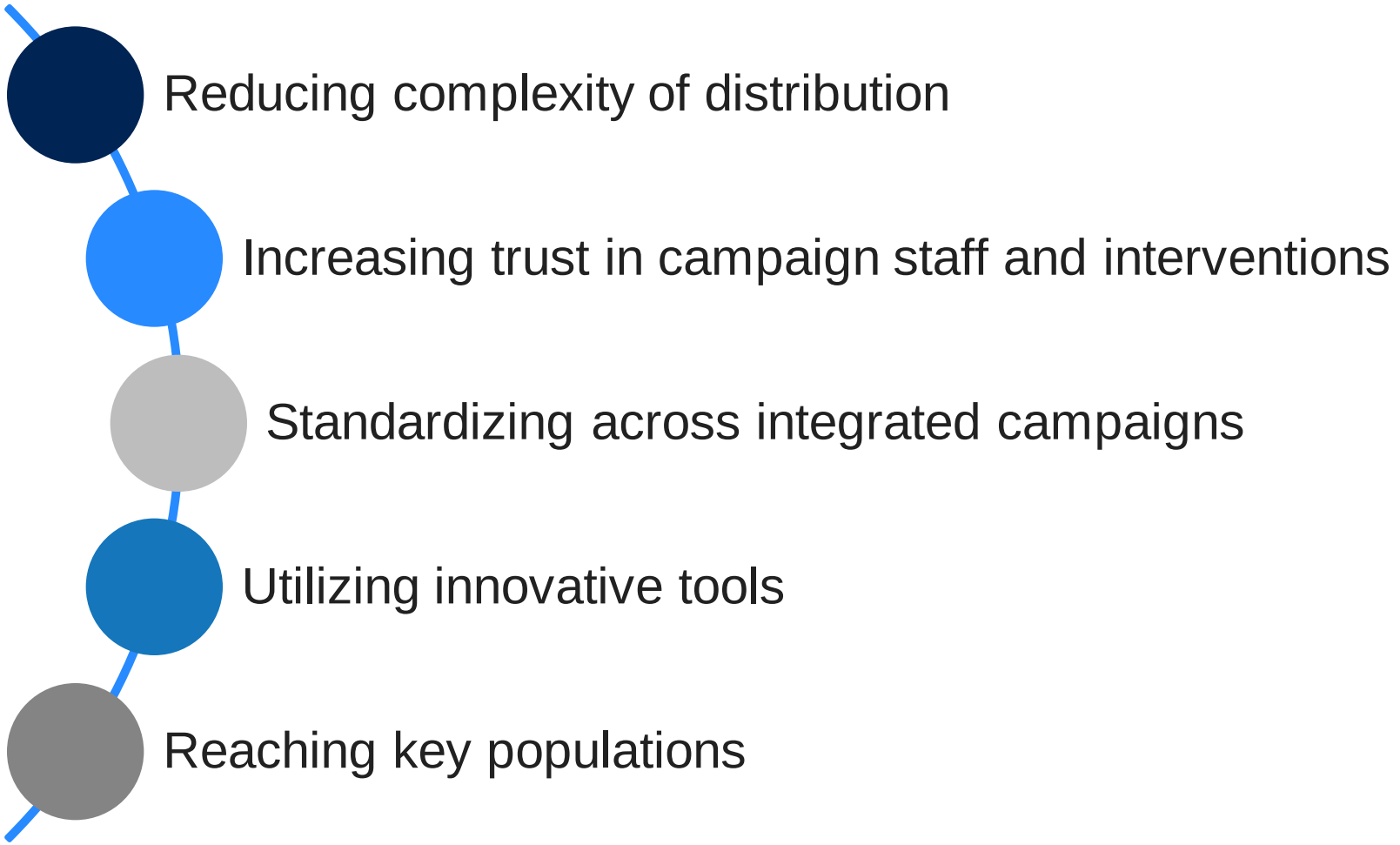
KEY THEMES FOR RECOMMENDATIONS



METHODOLOGY

SEARCH STRATEGY

- NTD-Immunization Integration Search (88 papers found; 7 relevant)
- Malaria-Immunization Integration Search (245 papers found; 11 relevant)

- Starting documents from BMGF
- Sources recommended by Eva Bazant, Task Force for Global Health
- Informal supplementary searches through google scholar
- 13 sources included in review

- Leveraging reference sections of key documents identified in grey literature search
- Emphasis on previously compiled reviews from Task Force for Global Health
- 35 papers included in review

FINDINGS

1. Planning Processes
2. Equity and Coverage
3. Program Costs
4. Human Resources
5. Digital Tools
6. Reaching the Elderly

Photo: AP News

1. PLANNING PROCESSES

1A. PLANNING PROCESSES

KEY FINDINGS

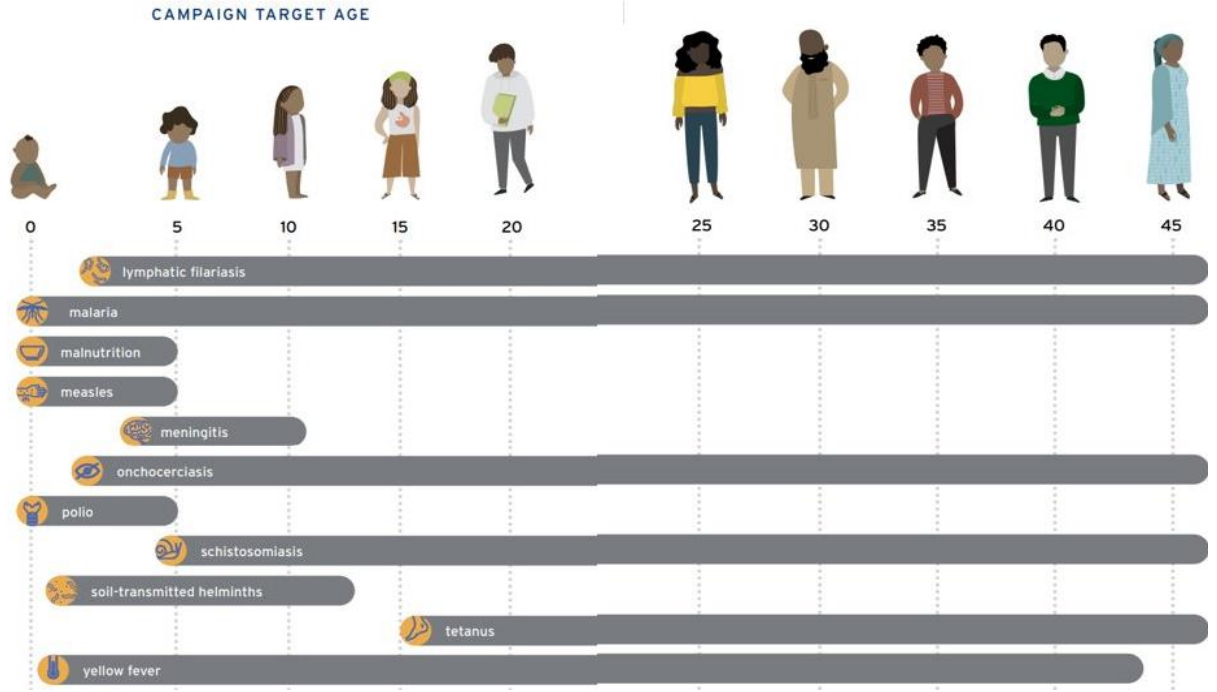
EVIDENCE FROM LITERATURE

1

Strategically targeting overlapping age groups for health interventions

In Tanzania, **integration of child survival interventions minimized redundancies by removing repeat activities (e.g., health worker supervision)** in the same target populations and time period. (Mwingira et al., 2016)

In Togo, an **integrated campaign was optimal for a follow-up measles SIA, malaria prevention, and polio vaccination.** However, the <9 months age group was only given polio vaccinations, not malaria prevention. (CDC 2005)



Source: State of Health Delivery Campaigns. Task Force For Global Health. 2021.

1B. PLANNING PROCESSES

KEY FINDINGS	EVIDENCE FROM LITERATURE
2 **Clearly communicating a unified message to the health posts regarding services to be provided**	In Togo, a unified message was not communicated clearly to the health posts regarding a one-net-per-household or one-net-per-child strategy. Fear of shortages prompted health posts in one region to switch from the MOH-recommended policy. (CDC 2005)
3 **Campaign microplanning that leverages perspectives from community leaders and clearly articulates roles and responsibilities**	**Micronarrative surveys** between rounds of MDA treatment for Lymphatic Filariasis in Indonesia were credited in the improvement of MDA compliance from 57% to 77% in two districts (Krentel et al., 2016).
	The Reaching Every District (RED) approach to microplanning from the bottom-up may have potential for applications other than vaccination (Enkhtuya et al., 2009).

2. EQUITY AND COVERAGE

2A. EQUITY AND COVERAGE

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **More equity observed by offering multiple services to hard-to-reach communities**	In Ghana, post-measles campaign coverage of insecticide-treated bednets for households in the **poorest quintile** was 10 times higher than pre-campaign coverage of households in the **wealthiest quintile (90.2% vs 9.0%)** (Grabowsky et al., 2005)
	In Togo, equity was assessed across wealth quintiles by offering ITNs during National Immunization week. Household ownership of ITNs increased across all economic quintiles with an **equity ratio among ITN owners of 1.0 vs 0.25 pre-campaign** (Wolkon et al., 2010)
	In a combined ITN and Measles campaign, ITN coverage among children **in rural areas rose from 16.7% to 81.1% (equity ratio from 0.32 to 0.88)** and in the urban area from 50.7% to 76.2% (equity ratio: 0.66 to 1.19). (Grabowsky et al., 2005 (2))

2B. EQUITY AND COVERAGE

KEY FINDINGS	EVIDENCE FROM LITERATURE
2 **Increased coverage by reducing time expended on community-based health-care activities**	In Lao PDR, more participants were observed at an integrated campaign to receive vaccination and deworming. Key factors included utilization of communication and distribution channels established by the EPI, and **greater attraction of target individuals because multiple health services were provided at the same time**. (Boselli et al., 2011)
	In Tanzania, coverage of the **LF MDA program increased from 86% in 2013 to 93% in 2014**. **Measles-Rubella vaccination coverage remained high with 97% coverage in 2014.** High demand for immunizations in the communities due to years of **Gavi advocacy**, and it benefited the MDA program to be linked to these popular services. (Mwingira et. al., 2016)
	In a comparison of integrated campaigns in Niger and Togo, Togo's OPV coverage and ITN distribution among eligible children was higher (93.7% for OPV and 90.8% for ITNs as they directly distributed ITNs at the time of vaccination. **Niger used a more complicated voucher and nail-marking system, 31.9% of eligible mothers did not receive vouchers, nail markings, or either.** (CDC 2005)

3. PROGRAM COSTS

3A. PROGRAM COSTS

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **Coordination between programs minimizes service delivery cost due to similarities in target groups, field staff, logistical requirements**	In Lao PDR, the integration of anthelmintics distribution into the existing immunization and vitamin A supplementation campaign enabled deworming an individual with as little as US$0.02. **This is ten times lower than the cost of deworming during vertical campaigns (US$0.25)**. (Boselli et al., 2011)
	Assuming equal attribution of shared costs between LLITN distribution and measles vaccination, **net costs per LLITN distributed in Togo were 4.41 USD**, when saved treatment costs were considered.
	Assuming a constant utilization of LLITNs by the target group over three years, **1.2 million cases could be prevented at a net cost per case averted of 3.26 USD**. The net costs were 635 USD per death averted and 16.39 USD per DALY averted, respectively.
	In comparison, **social marketing of ITNs** in two rural districts of Tanzania **cost nearly 1,560 USD per death averted, 57 USD per DALY averted and 8.30 USD per net distributed**. (Mueller et al., 2008)

3B. PROGRAM COSTS

KEY FINDINGS	EVIDENCE FROM LITERATURE
2 **Challenges managing per diem for health workers vs CDDs as they cannot be involved in campaign due to vaccine delivery training requirements**	Per diems from NTD MDA campaigns are an income source for CDDs. However, **in Tanzania, few CDDs were involved in the coordinated MR-MDA campaign due to vaccine delivery training requirements**. To counter any resulting loss to CDD retention, the MOH required different CDDs to be involved on different days to allow more volunteers to participate and benefit from daily per diems. (Mwingira et al., 2016)
	Lack of standardized renumeration packages between program staff creates disincentives between health worker cadres and may harm routine service delivery. (Grépin et al., 2008)

4. HUMAN RESOURCES

4A. HUMAN RESOURCES

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **Coordination and assignment of shared responsibilities prevent overburdening of health workers during Child Health Days and other high-volume treatment events.**	The **decentralization** of planning activities of Child Health Days in Tanzania and Zimbabwe led to successful implementation of integrated programs (Doherty et al., 2010).
	In cases where integration may result in heterogenous treatment times, an **organized referral system between community health workers may prevent treatment times from impacting integrated campaign delivery** (Wallace et al., 2012).

4B. HUMAN RESOURCES

KEY FINDINGS	EVIDENCE FROM LITERATURE
2 **Community Health Workers play a key role in integrated campaign delivery and help minimize the disruption of routine services.**	**CHWs from local communities increase acceptance of MDA** through **building trust** and combatting rumors by serving as referrals to community members with doubts (Silumbwe et al., 2019).
	The Integrated Community Case Management (iCCM) strategy has been implemented in hard-to-reach areas of 18 sub-Saharan African countries. Cadres of CHWs are trained to treat common illnesses but also in some cases to **mobilize communities for vaccinations** (The Global Fund, 2018).

4C. HUMAN RESOURCES

KEY FINDINGS	EVIDENCE FROM LITERATURE
③ **Development of standardized training manuals, SOPs, and training sessions on logistics and social mobilization are key steps for program integration.**	**Training** was associated with **reduced work burden on staff** and may have implications for program coverage (Wallace et al., 2009).
	Trust in MDA can be decreased when CHWs are perceived as **not being knowledgeable** about the drugs they are distributing (Grant et al., 2017) and knowledge of CHWs has been associated with increases in MDA compliance (Inobaya et al., 2018).

5. DIGITAL TOOLS

5A. DIGITAL TOOLS

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **Automated GIS methods for enumerating intervention areas exist in Malaria IRS campaigns, NTD MDA scenarios.**	GIS microplanning may incur higher overall costs but **is more cost-effective per DALY averted** than traditional microplanning due to **higher numbers of participants reached.** (Ali et al., 2020)
	Two Global Grand Challenges grants were awarded in 2020 to Associação Academica de Nutrição e Segurança Alimentar and Food Chain LLC for tools that will allow for Interactive High-Resolution Geospatial Mapping to Inform Health Campaign Targeting in Mozambique and Automated Creation of Microplans Using Novel Data Sources, respectively.

ESPEN EXPANDED SPECIAL PROJECT FOR ELIMINATION OF NEGLECTED TROPICAL DISEASES

deworm3

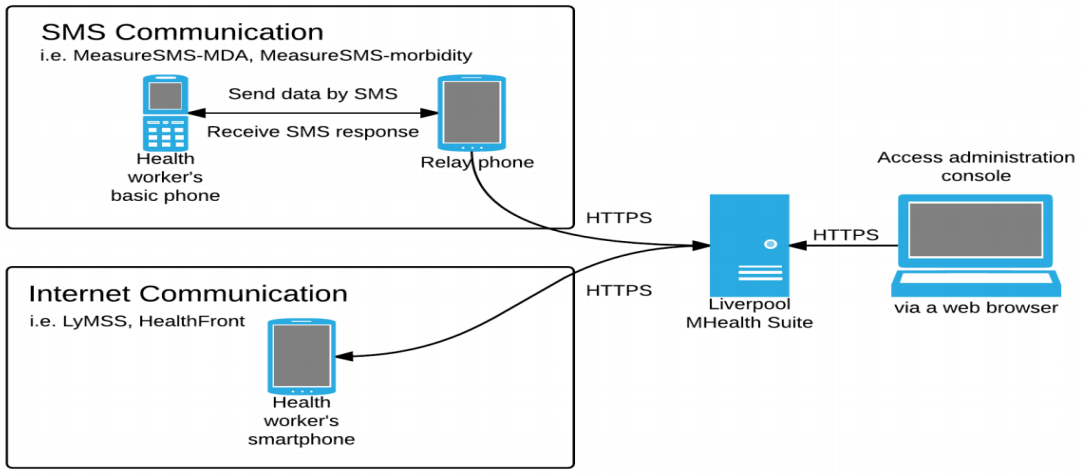
GRID3 GEO-REFERENCED INFRASTRUCTURE AND DEMOGRAPHIC DATA FOR DEVELOPMENT

Bluesquare

5B. DIGITAL TOOLS

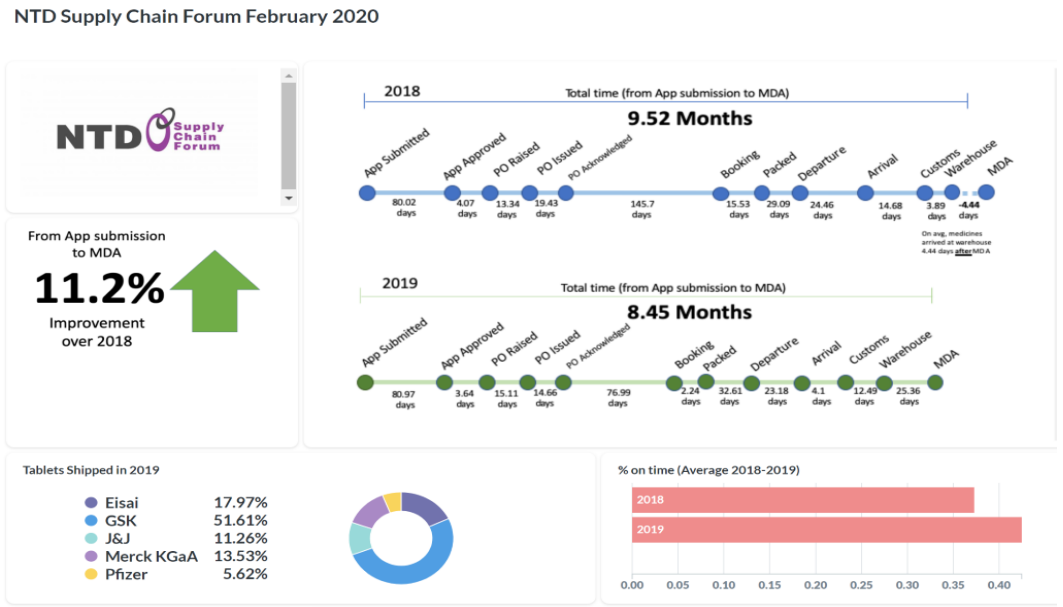
KEY FINDINGS	EVIDENCE FROM LITERATURE
2 **Mobile-based applications designed for use in the field**	**The Liverpool mHealth Suite** uses SMS messaging and push notifications to promote awareness with target populations, manage supply stockouts, and alert communities to anticipated delivery bottlenecks, which may increase uptake and reduce refusals. (Stanton et al, 2016)
	Episurveyor application used in Kenyan measles supplemental immunization campaign (Mbabazi et al, 2012) for recording house visitation, immunization records, qualitative feedback, and reporting on adverse events.
	Standardized monitoring checklists that can be **uploaded to ODK via mobile devices** for report generation have been used successfully by NTD programs integrated with routine immunization. (Bawa et al., 2018)

Figure 1. The two main approaches of the Liverpool mHealth Suite (LMS).



5C. DIGITAL TOOLS

KEY FINDINGS	EVIDENCE FROM LITERATURE
3 **Supply chain and medication management tools for national-level drug distribution**	Dedicated Control Tower within the **DHL Global Humanitarian Logistics Competence Center** organizes shipping and distribution of NTD medication from global production hubs to ports.
	www.ntdeliver.com Tracker allows for planning of NTD campaigns based on arrival and expiration information for medication shipments. Similar process could be established for delivery of vaccines, dependent on transportation requirements.



6. REACHING THE ELDERLY

6A. REACHING THE ELDERLY

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **There is a paucity of literature on reaching elderly populations in LMICs**	The primary result for a search targeting NTDs and elderly populations is a Peter Hotez blog article from 2014 highlighting the **elderly as a neglected population within neglected tropical diseases** (Hotez, P. 2014)**.** Most available studies speak to deworming or other MDA activities aimed at the broader community or specific pediatric populations.

6B. REACHING THE ELDERLY

KEY FINDINGS	EVIDENCE FROM LITERATURE
2 **International Council on Adult Immunization guidance suggests certain approaches for successful adult immunization platforms**	This roadmap recommends **integrating delivery of vaccination to where older adults would otherwise seek care, removing barriers to access, advocating for the rights of older adults in national vaccine rollout plans, and leveraging existing health and wellness registries** of older adults as in India (Lahariya and Bhardwaj, 2020).
	Integrated study by the Carter Center and SightSavers compared a centralized referral method to a house-to-house Point of Care (PoC) strategy and found reductions in cost per trachomatous trichiasis case ($19.97 vs $20.85) and higher surgery rates (83.9% vs 72.4%) for the PoC strategy (Buyon et al., 2018). **Authors indicate removal of logistical and travel barriers as key for reaching elderly populations.**

6C. REACHING THE ELDERLY

KEY FINDINGS	EVIDENCE FROM LITERATURE
3 **NGOs with an established track record in treating NTDs in elderly populations could be valuable partners (i.e. MacArthur finalist Vision4Africa)**	**SightSavers** and other partners have resumed trachoma campaigns with COVID considerations. Part of adaptation involved training 1,700 volunteers in Nigeria to conduct **house-to-house activities** (SightSavers, 2020)
	Christian Blind Mission trained over 65,000 community volunteers and treated 34 million people in Onchocerciasis-endemic areas in 2016 (CBM, 2017).

RECOMMENDATIONS

RECOMMENDATIONS

- Purpose:
  - Examine current approaches to integration of programs
  - Highlight challenges and benefits to integration
  - Provide recommendations to leverage the NTD platform for distribution of COVID-19 vaccinations

Photo: UNICEF

RECOMMENDATIONS

1. Avoid complications in distribution
   - Point of Care distribution may support higher uptake when compared to referral centralization or voucher systems
2. Standardize across campaign staff whenever possible
   - Renumerations schemes
   - Trainings and Operating Procedures
   - Monitoring and supervision
   - Social Mobilization messaging
3. Use digital tools for campaign microplanning
   - Mapping and enumeration
   - Field-based reporting and coordination
   - Supply chain and national-level logistics

Photo: Global Times

RECOMMENDATIONS

4. Integrate delivery with trusted workers and proven programs
   - CHWs and people trusted by the community
   - Proven interventions with visible benefits that align with community priorities
5. Partner with NGOs and advocacy groups who have expertise in reaching elderly populations
   - Integrating vaccine delivery to where older adults seek care
   - Removing barriers to access such as travel to referral hubs or voucher distribution
   - Advocating for the rights of older adults in vaccine rollout
   - Leveraging existing health and wellness registries

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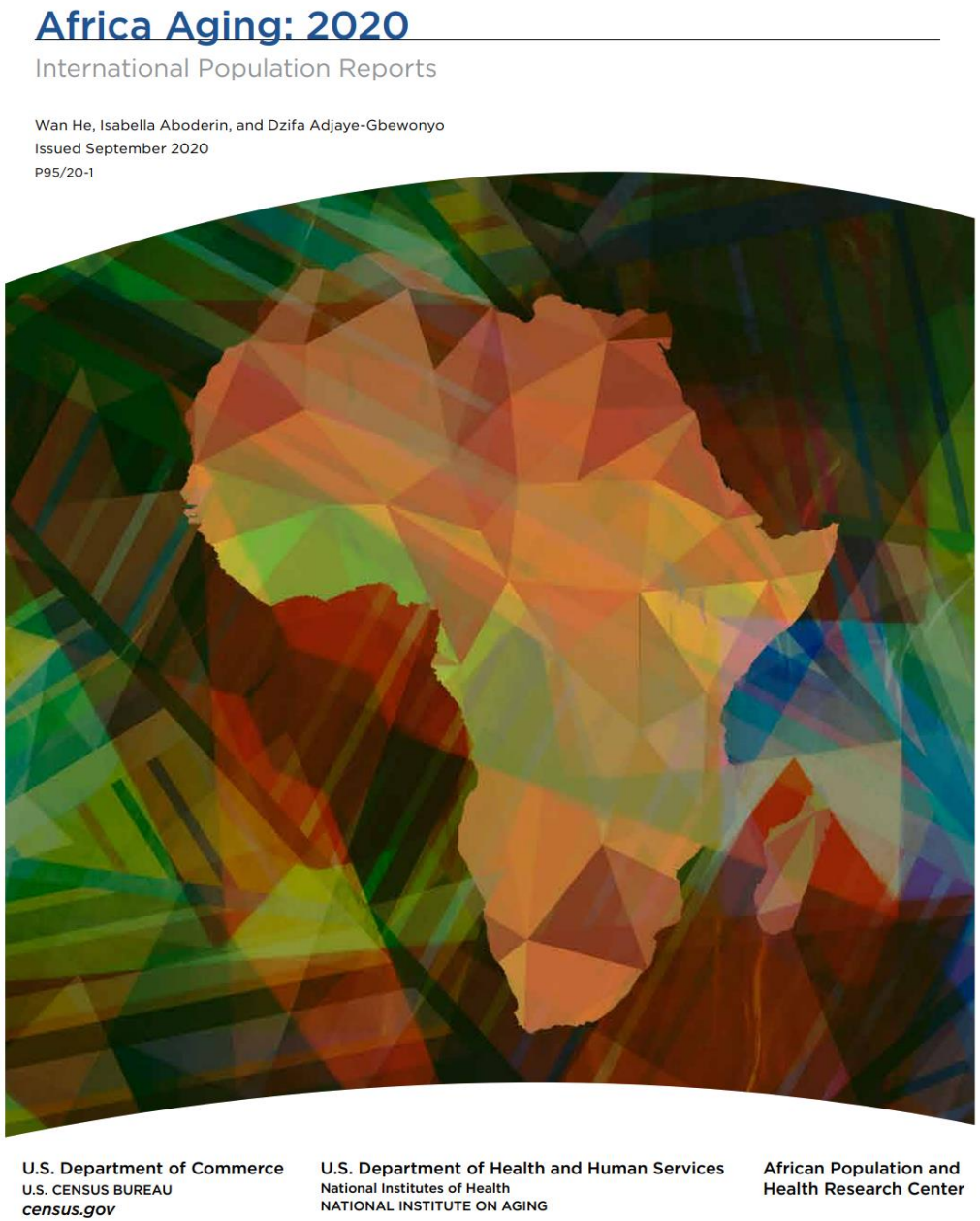
Photo: NPR

RECOMMENDATIONS

- Areas of Future Research
  - Where do the elderly seek care?
  - What registries for older adults already exist? Could new registries be created in concert with COVID-19 vaccine distribution? With community-wide MDA?
    - Estimated rates of co-residence with <5 range from about 25 to 30 percent to a high of about 50 percent (Africa Aging: 2020, US Census Bureau).
  - What specific challenges occur when integrating vaccination with NTD programs, rather than the reverse?
  - How to prioritize and target key populations in the context of COVID-19 vaccination rollout in LMICs?
  - How can alignment with community priorities be incorporated into campaign microplanning in a systematic way?



THANK YOU

START CENTER
STRATEGIC ANALYSIS,
RESEARCH & TRAINING CENTER

PUBMED SEARCH

Process	Results (Integration with NTDs)
Sources Investigated	• 88 Papers Found
Papers Included for Further Review	• 7 Papers Included • Workshop report/commentary (5) • Research articles (2) - both captured in reverse search

Process	Results (Integration with Malaria)
Sources Investigated	• 243 Papers Found
Papers Included for Further Review	• 11 Papers Included • 5 also captured in reverse search • Mostly focused on distribution of insecticide-treated bednets during routine immunization campaigns

Query	Results	Time
Search: **("Neglected Diseases"[Mesh] OR "neglected diseases" OR "neglected tropical diseases") AND ("Vaccines"[Mesh] OR "Immunization"[Mesh] OR "Immunization Programs"[Mesh] OR "Mass Vaccination"[Mesh] OR immuniz* OR vaccin*) AND ("Systems Integration"[Mesh] OR platform OR "delivery platform" OR integrat* OR "drug distribution" OR campaign OR co-distribution)** ("Neglected Diseases"[MeSH Terms] OR "Neglected Diseases"[All Fields] OR "neglected tropical diseases"[All Fields]) AND ("Vaccines"[MeSH Terms] OR "Immunization"[MeSH Terms] OR "Immunization Programs"[MeSH Terms] OR "Mass Vaccination"[MeSH Terms] OR "immuniz*"[All Fields] OR "vaccin*"[All Fields]) AND ("Systems Integration"[MeSH Terms] OR ("platform"[All Fields] OR "platform s"[All Fields] OR "platforms"[All Fields]) OR "delivery platform"[All Fields] OR "integrat*"[All Fields] OR "drug distribution"[All Fields] OR ("campaign"[All Fields] OR "campaign s"[All Fields] OR "campaigned"[All Fields] OR "campaigner"[All Fields] OR "campaigners"[All Fields] OR "campaigning"[All Fields] OR "campaigns"[All Fields]) OR "co-distribution"[All Fields])	88	20:19:53

Query	Results	Time
Search: **("Malaria"[Mesh] OR malaria OR "bednet distribution") AND ("Immunization"[Mesh] OR "Immunization Programs"[Mesh] OR "Mass Vaccination"[Mesh] OR immuniz* OR "Vaccination Campaign") AND ("Systems Integration"[Mesh] OR platform OR "delivery platform" OR integrat* OR "drug distribution" OR co-distribution)** ("Malaria"[MeSH Terms] OR ("Malaria"[MeSH Terms] OR "Malaria"[All Fields] OR "malarias"[All Fields] OR "malaria s"[All Fields] OR "malariae"[All Fields]) OR "bednet distribution"[All Fields]) AND ("Immunization"[MeSH Terms] OR "Immunization Programs"[MeSH Terms] OR "Mass Vaccination"[MeSH Terms] OR "immuniz*"[All Fields] OR "Vaccination Campaign"[All Fields]) AND ("Systems Integration"[MeSH Terms] OR ("platform"[All Fields] OR "platform s"[All Fields] OR "platforms"[All Fields]) OR "delivery platform"[All Fields] OR "integrat*"[All Fields] OR "drug distribution"[All Fields] OR "co-distribution"[All Fields])	243	17:24:07

GREY LITERATURE

Process	Results
Sources Investigated	• Coalition for Campaign Effectiveness Literature Reviews (n=6) • Supplementary documents from Task Force for Global Health (Per Eva Bazant, n=11) • Supplementary documents from Bill & Melinda Gates Foundation (n=3)
Papers Included for Further Review	• 13 Sources Included
Key Themes Identified	• When to integrate and why • Challenges and benefits of integration • iCCM Program • Lack of information on Elderly populations

Title	Relevant	Reviewer	Publicatio	Author	Material	Key Findings	Url	Organization
Integration Between Health Campaigns: Intervention Co-delivery and Collaboration	Yes	Will	2020	Barkha Bh	Technical Brief		https://campaigneffectiv	Health Campaign Effectiveness Coalition
Public Health Campaign Integration: Lessons Learned from 30 Years of Polio Campaigns in Ethiopia, India, and Nigeria	Yes	Will	2020	Abigail Ne	Technical Brief		https://campaigneffectiv	Health Campaign Effectiveness Coalition
PROMISING PRACTICES IN HEALTH CAMPAIGN MICROPLANNING	Yes	Will	2020	Camber Cc	Technical Brief		https://campaigneffectiv	Health Campaign Effectiveness Coalition
Transitioning Delivery of Health Campaign Interventions to the Primary Health Care System: Achieving a Strategic Balance of Independent and Integrated Delivery of Interventions	Yes	Will	2021	Barkha Bh	Technical Brief		https://campaigneffectiv	Health Campaign Effectiveness Coalition
Integration Insights: Findings from Liberia	Yes	Will	2020	Task Force	Poster Presentation		https://campaigneffectiv	Health Campaign Effectiveness Coalition
Integrated Campaign of Measles and Polio Vaccines, Vitamin A and Deworming in Banadir, Somalia	Yes	Will	2020	Dr. Muhan	Presentation Recording		https://campaigneffectiv	Health Campaign Effectiveness Coalition
Opportunities and Challenges for Campaign Integration During the								

REVERSE SEARCH

Process	Results
Sources Investigated	• 20 reference sections from documents identified in the Grey Literature Search
Papers Included for Further Review	• 35 Papers Included
Key Themes Identified	• NTDs being integrated into routine vaccination • Child Health Days/National Health Weeks

Title	Publicatio	Author	Abstract Note	Focus Area
Feasibility and costs of a targeted cholera vaccination campaign in Ethiopia	2018	Teshome,	Shanchol™, a WHO-prequalified oral cholera vaccine (OCV), has been	Integration Costs
Integration of immunization services with other health interventions in the developing world: what works and why? Systematic literature review	2009	Wallace, A	OBJECTIVE: To assess benefits, challenges and characteristics of integ	SLR
Distribution of free untreated bednets bundled with insecticide via an integrated child health campaign in Lindi Region, Tanzania: lessons for future campaigns	2007	Skarbinski	Use of insecticide-treated bednets (ITNs) to prevent malaria remains	Bednets
African vaccination week as a vehicle for integrated health service delivery	2015	Mihigo, Ri	African Vaccination Week (AVW) is an initiative of the Member States	Child Health Days
The Role of Child Health Days in the Attainment of Global Deworming Coverage Targets among Preschool-Age Children	2015	Kumapley,	Background Global deworming programs aim to reach 75% of at-risk	Child Health Days
Integration of deworming into an existing immunization and vitamin A supplementation campaign is a highly effective approach to maximize health benefits with minimal cost in Lao PDR	2011	Boselli, Gi	Infection with soil-transmitted helminths (STHs) is a major public health problem in many developing countrie	
Integration of vaccine supply chains with other health commodity supply chains: a framework for decision making	2014	Yadav, Pra	One of the primary objectives of National Immunization Programs is to strengthen and optimize immunizatior	
High coverage of vitamin A supplementation and measles vaccination during an integrated Maternal and Child Health Week in Sierra Leone	2015	Sesay, Fatr	BACKGROUND: In May 2012, the twice-yearly Maternal and Child Health Week (MCHW) integrated vitamin A	
The use of mass campaigns in the expanded program on immunization: a review of reported advantages and disadvantages	1997	Dietz, V.; C	The use of mass immunization campaigns (MICs) has been and remains controversial. To evaluate these camp	
Integrating national community-based health worker programmes into health systems: a systematic review identifying lessons learned from low-and middle-income countries	2014	Zulu, Jose	Despite the development of national community-based health worker (CBHW) programmes in several low- an	
Moving from vertical to integrated child health programmes: experiences from a multi-country assessment of the Child Health Days approach in				

PLANNING PROCESSES

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **Strategically targeting overlapping age groups for the health interventions**	In Tanzania, **integration of child survival interventions minimized redundancies by removing repeat activities (e.g., health worker supervision)** in the same target populations and time period. (Mwingira et al., 2016)
	In Togo, an **integrated campaign was optimal for a follow-up measles SIA, malaria prevention, and polio vaccination.** However, the <9 months age group was only given polio vaccinations, not malaria prevention. (CDC 2005)
2 **Clearly communicating a unified message to the health posts regarding services to be provided**	In Togo, a unified message was not communicated clearly to the health posts regarding a one-net-per-household or one-net-per-child strategy. Fear of shortages prompted health posts in one region to switch from the MOH-recommended policy. (CDC 2005)
3 **Campaign microplanning that leverages perspectives from community leaders and clearly articulates roles and responsibilities**	**Micronarrative surveys** between rounds of MDA treatment for Lymphatic Filariasis in Indonesia were credited in the improvement of MDA compliance from 57% to 77% in two districts (Krentel et al., 2016).
	The Reaching Every District (RED) approach to microplanning from the bottom-up may have potential for applications other than vaccination (Enkhtuya et al., 2009).

EQUITY AND COVERAGE

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **More equity observed by offering multiple services to hard-to-reach communities**	In Ghana, post-measles campaign coverage of insecticide-treated bednets for households in the **poorest quintile** was 10 times higher than pre-campaign coverage of households in the **wealthiest quintile (90.2% vs 9.0%)** (Grabowsky et al., 2005)
	In Togo, equity was assessed across wealth quintiles by offering ITNs during National Immunization week. Household ownership of ITNs increased across all economic quintiles with an **equity ratio among ITN owners of 1.0 vs 0.25 pre-campaign** (Wolkon et al., 2010)
	In a combined ITN and Measles campaign, ITN coverage among children **in rural areas rose from 16.7% to 81.1% (equity ratio from 0.32 to 0.88)** and in the urban area from 50.7% to 76.2% (equity ratio: 0.66 to 1.19). (Grabowsky et al., 2005 (2))
2 **Increased coverage by reducing time expended on community-based health-care activities**	In Lao PDR, more participants were observed at an integrated campaign to receive vaccination and deworming. Key factors included utilization of communication and distribution channels established by the EPI, and **greater attraction of target individuals because multiple health services were provided at the same time**. (Boselli et al., 2011)
	In Tanzania, coverage of the **LF MDA program increased from 86% in 2013 to 93% in 2014**. **Measles-Rubella vaccination coverage remained high with 97% coverage in 2014.** High demand for immunizations in the communities due to years of **Gavi advocacy**, and it benefited the MDA program to be linked to these popular services. (Mwingira et. al., 2016)
	In a comparison of integrated campaigns in Niger and Togo, Togo's OPV coverage and ITN distribution among eligible children was higher (93.7% for OPV and 90.8% for ITNs as they directly distributed ITNs at the time of vaccination. **Niger used a more complicated voucher and nail-marking system, 31.9% of eligible mothers did not receive vouchers, nail markings, or either.** (CDC 2005)

PROGRAM COSTS

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **Coordination between programs minimizes service delivery cost due to similarities in target groups, field staff, logistical requirements**	In Lao PDR, the integration of anthelmintics distribution into the existing immunization and vitamin A supplementation campaign enabled deworming an individual with as little as US$0.02. **This is ten times lower than the cost of deworming during vertical campaigns (US$0.25)**. (Boselli et al., 2011)
	Assuming equal attribution of shared costs between LLITN distribution and measles vaccination, **net costs per LLITN distributed in Togo were 4.41 USD**, when saved treatment costs were considered.
	Assuming a constant utilization of LLITNs by the target group over three years, **1.2 million cases could be prevented at a net cost per case averted of 3.26 USD**. The net costs were 635 USD per death averted and 16.39 USD per DALY averted, respectively.
	In comparison, **social marketing of ITNs** in two rural districts of Tanzania **cost nearly 1,560 USD per death averted, 57 USD per DALY averted and 8.30 USD per net distributed**. (Mueller et al., 2008)
2 **Challenges managing per diem for health workers vs CDDs as they cannot be involved in campaign due to vaccine delivery training requirements**	Per diems from NTD MDA campaigns are an income source for CDDs. However, **in Tanzania, few CDDs were involved in the coordinated MR-MDA campaign due to vaccine delivery training requirements**. To counter any resulting loss to CDD retention, the MOH required different CDDs to be involved on different days to allow more volunteers to participate and benefit from daily per diems. (Mwingira et al., 2016)
	Lack of standardized renumeration packages between program staff creates disincentives between health worker cadres and may harm routine service delivery. (Grépin et al., 2008)

HUMAN RESOURCES

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **Coordination and assignment of shared responsibilities prevent overburdening of health workers during Child Health Days and other high-volume treatment events.**	The **decentralization** of planning activities of Child Health Days in Tanzania and Zimbabwe led to successful implementation of integrated programs (Doherty et al., 2010).
	In cases where integration may result in heterogenous treatment times, an **organized referral system between community health workers may prevent treatment times from impacting integrated campaign delivery** (Wallace et al., 2012).
2 **Community Health Workers play a key role in integrated campaign delivery and help minimize the disruption of routine services.**	**CHWs from local communities increase acceptance of MDA** through **building trust** and combatting rumors by serving as referrals to community members with doubts (Silumbwe et al., 2019).
	The Integrated Community Case Management (iCCM) strategy has been implemented in hard-to-reach areas of 18 sub-Saharan African countries. Cadres of CHWs are trained to treat common illnesses but also in some cases to **mobilize communities for vaccinations** (The Global Fund, 2018).
3 **Development of standardized training manuals, SOPs, and training sessions on logistics and social mobilization for program workers and community volunteers are key steps for program integration.**	**Training** was associated with **reduced work burden on staff** and may have implications for program coverage (Wallace et al., 2009).
	Trust in MDA can be decreased when CHWs are perceived as **not being knowledgeable** about the drugs they are distributing (Grant et al., 2017) and knowledge of CHWs has been associated with increases in MDA compliance (Inobaya et al., 2018).

DIGITAL TOOLS

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **Automated GIS methods for enumerating intervention areas exist in Malaria IRS campaigns, NTD MDA scenarios.**	GIS microplanning may incur higher overall costs but **is more cost-effective per DALY averted** than traditional microplanning due to **higher numbers of participants reached.** (Ali et al., 2020)
	Two Global Grand Challenges grants were awarded in 2020 to Associação Academica de Nutrição e Segurança Alimentar and Food Chain LLC for tools that will allow for Interactive High-Resolution Geospatial Mapping to Inform Health Campaign Targeting in Mozambique and Automated Creation of Microplans Using Novel Data Sources respectively.
2 **Mobile-based applications designed for use in the field**	**The Liverpool mHealth Suite** contains functionality for SMS messaging and push notifications can be used to promote awareness with target populations, manage supply stockouts, and alert communities to anticipated delivery bottlenecks, which may increase uptake and reduce refusals (Stanton et al, 2016).
	Episurveyor application used in Kenyan measles supplemental immunization campaign (Mbabazi et al, 2012) for recording house visitation, immunization records, qualitative feedback, and reporting on adverse events.
	Standardized monitoring checklists that can be **uploaded to ODK via mobile devices** for report generation have been used successfully by NTD programs integrated with routine immunization. (Bawa et al., 2018)
3 **Supply chain and medication management tools for national-level drug distribution**	Dedicated Control Tower within the **DHL Global Humanitarian Logistics Competence Center** organizes shipping and distribution of NTD medication from global production hubs to ports. Similar process could be established for delivery of vaccines, dependent on transportation requirements.
	www.ntdeliver.com Tracker allows for planning of NTD campaigns based on arrival and expiration information for medication shipments. Similar process could be established for delivery of vaccines.

REACHING THE ELDERLY

KEY FINDINGS	EVIDENCE FROM LITERATURE
1 **There is a paucity of literature on reaching elderly populations in LMICs**	The primary result for a search targeting NTDs and elderly populations is a Peter Hotez blog article from 2014 highlighting the **elderly as a neglected population within neglected tropical diseases** (Hotez, P. 2014)**.** Most available studies speak to deworming or other MDA activities aimed at the broader community or specific pediatric populations.
2 **International Council on Adult Immunization guidance suggests certain approaches for successful adult immunization platforms**	This roadmap recommends **integrating delivery of vaccination to where older adults would otherwise seek care, removing barriers to access, advocating for the rights of older adults in national vaccine rollout plans, and leveraging existing health and wellness registries** of older adults as in India (Lahariya and Bhardwaj, 2020).
	Integrated study by the Carter Center and SightSavers compared a centralized referral method to a house-to-house Point of Care (PoC) strategy and found reductions in cost per trachomatous trichiasis case ($19.97 vs $20.85) and higher surgery rates (83.9% vs 72.4%) for the PoC strategy (Buyon et al, 2018). **Authors indicate removal of logistical and travel barriers as key for reaching elderly populations.**
3 **NGOs with an established track record in treating NTDs in elderly populations could be valuable partners (i.e. MacArthur finalist Vision4Africa)**	**SightSavers** and other partners have resumed trachoma campaigns with COVID considerations. Part of adaptation involved training 1,700 volunteers in Nigeria to conduct **house-to-house activities** (SightSavers, 2020)
	Christian Blind Mission trained over 65,000 community volunteers and treated 34 million people in Onchocerciasis-endemic areas in 2016 (CBM, 2017).