

National Immunization Policy implementation considerations

July 2013

This rapid response was prepared by the Uganda country node of the Regional East African Community Health (REACH) Policy Initiative.

Key Messages

- There is a protective effect on the whole population when a given sufficient proportion of that population is immunized - a phenomenon referred to as *herd immunity*
 - Therefore coverage rates need to aim at certain proportions if not 100% to be able to attain this effect

- Implementation considerations for the immunization policy include:
 - Cost of immunization
 - Proven strategies to increase coverage
 - Barriers to successful implementation and strategies to mitigate these



Who requested this rapid response?

This document was prepared in response to a specific question from a Senior Health policymaker in Uganda.

! This rapid response includes:

- **Summary of research findings**, based on one or more documents on this topic
- **Relevance** for low and middle income countries

X Not included:

- Recommendations
- Examples or detailed descriptions of implementation

What is the SURE Rapid Response Service?

SURE Rapid Responses address the needs of policymakers and managers for research evidence that has been appraised and contextualised in a matter of hours or days, if it is going to be of value to them. The Responses address questions about arrangements for organising, financing and governing health systems, and strategies for implementing changes.

What is SURE?

SURE – Supporting the Use of Research Evidence (SURE) for policy in African health systems - is a collaborative project that builds on and supports the Evidence-Informed Policy Network (**EVIPNet**) in Africa and the Regional East African Community Health (**REACH**) Policy Initiative (see back page). SURE is funded by the European Commission's 7th Framework Programme.

www.evipnet.org/sure

Glossary

of terms used in this report:

www.evipnet.org/sure/rr/glossary

Background

How this Response was prepared

After clarifying the question being asked, we searched for systematic reviews, local or national evidence from Uganda, and other relevant research on the topic. The methods used by the SURE Rapid Response Service to find, select and assess research evidence are described here:

www.evipnet.org/sure/rr/methods

The importance of immunization is not debatable any more-it is reported to only be second to clean water in reducing the burden of infectious diseases (1). The World Health Organization (WHO) reported that 2.3 million childhood deaths from diphtheria, tetanus, pertussis (whooping cough), and measles are averted annually due to immunization, and another 1.5 million are lost due to preventable immunizable diseases in the same time (2). It has also been reported that if coverage is extended to desired levels in low and middle income countries, 426 million cases of illness and 6.4 million deaths would be averted between 2011 and 2020 (2, 3).

Immunization does not only prevent disease it mitigates the severe forms of these diseases too. Furthermore it prevents infections and reduces the complications associated with them, and in addition prevents some cancers for example cervical and hepatic cancer. Furthermore it results in treatment and productivity savings, an estimated \$151 billion in the world's 72 poorest countries between 2011 and 2020 (3).

When a given sufficient proportion of the population is immunized and immune to given diseases, because of the phenomenon of herd immunity, there is a protective effect on the whole population. Therefore coverage rates need to aim at certain proportions if not 100% to be able to attain this effect. However Uganda is one of those countries with a high burden of immunizable diseases yet registering low coverage rates. In 1999 the national coverage rate was 54%. This fell to 37% in 2000-01 before rising to 44% in 2006. It currently stands at 55%, which is still considered low.

The ministry of health is in the process of drafting a national immunization policy. This current draft policy is holistic and comprehensive and intends to harmonize efforts that contribute to reduction of mortality, morbidity and disability rates due to vaccine preventable diseases and to provide guidance on delivery of quality immunization services, delivery system and resource mobilization.

The above are good intentions. But these will require innovative ways of implementing the policy and in turn increasing coverage to realise the intended health outcomes. This paper uses both local and global evidence to provide policy implementation considerations for the new policy.

Summary of findings

Implementation considerations for the national immunization policy

Cost of immunization

To implement a policy like this one, there is a cost and part of assessing the feasibility of the policy includes consideration of costs. Table 1 below summarizes the costs of common vaccines on the Uganda National Expanded Program on Immunization (UNEPI) schedule and the average cost incurred per child using Global Alliance for Vaccines and Immunization (GAVI) and the United Nations Children's Fund (UNICEF) procured vaccines.

Table1: Cost of vaccines procured by GAVI/UNICEF, their WHO-recommended dosage and the average cost per child.

(U.S. \$; 10 dose vials unless otherwise indicated; Prices for 2010)

Vaccine	UNICEF/GAVI ¹	No. of doses as per WHO recommendation	Cost of vaccination UNICEF/GAVI/per child
BCG	0.11	1	0.11
DPT	0.18	3 +1	0.72
HepB	0.27	3 +1*	1.08
Hib (lyophilized)	3.40 (1 dose vial)	3 +1*	13.60
DPT-HepB-Hib (pentavalent)	2.94	3 +1	11.76
Pneumococcal (10- Or 13-valent)	7.00	3	21
Rotavirus	**	3 Rotateq 2 Rotarix	**
MMR (Zagreb strain)	0.93	2	1.86
Yellow fever	0.90	1	0.90

¹ Weighted average prices per dose

The cost of vaccination includes the full vaccination schedule and the including booster

*The booster doses for Hep B and Hib are not officially recommended in the WHO guidelines, but they are listed as an option if given in combination vaccine. Prices have been based on including the 4th dose (booster dose).

** Not yet procured by UNICEF/GAVI.

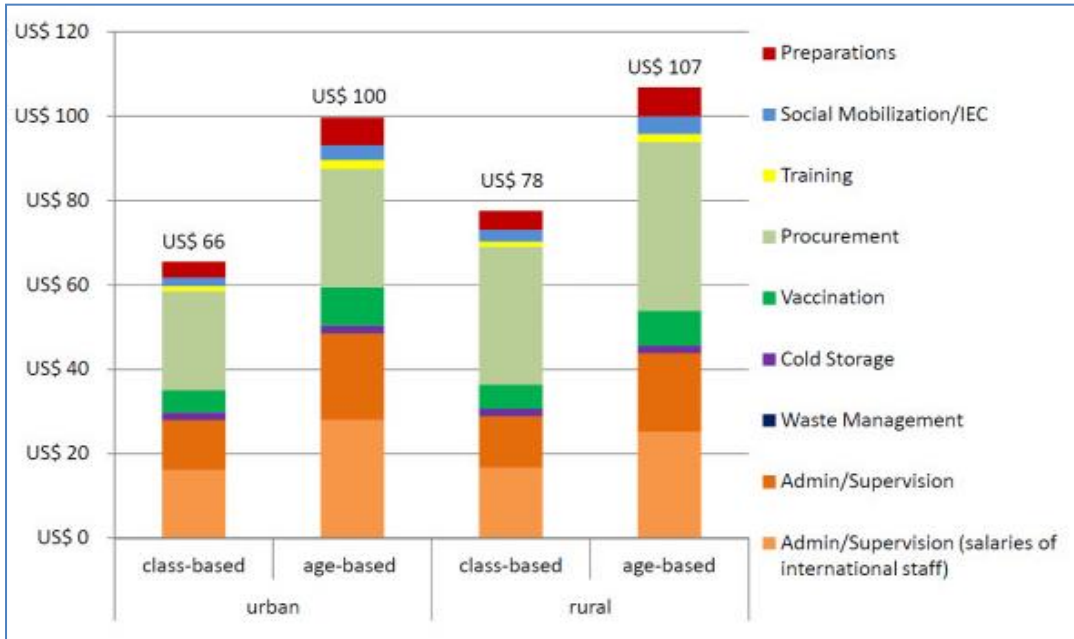
Source: Oxfam/MSF, 2010

In addition to the above costs evidence from a recent study by Quentin W and colleagues (2011) puts the cost of providing a single dose of HPV vaccine through a vertical school-based vaccination strategy at US\$3.15 (4). On the other hand, the cost of delivering a dose of the HPV vaccine integrated into an existing outreach program in Uganda was estimated at US\$1.65 per person while a similar arrangement in Tanzania would cost US\$ 1.73 (4, 5). Overall, approximately US\$4 to US\$10 per fully vaccinated girl

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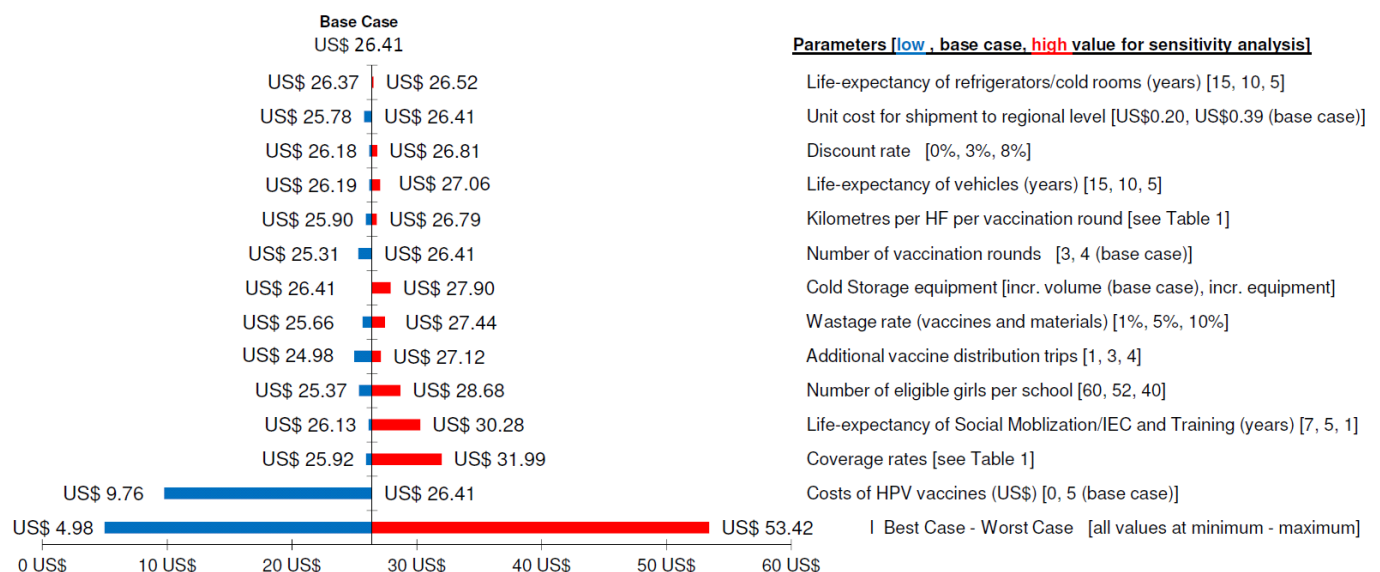
would be required for vaccine delivery costs. The above costs however does not include the cost of the vaccine which is estimated at US\$5 per dose (4). Figure 1 below shows the total economic costs (year 2011 US\$) per fully-immunized girl by school location and vaccination strategy from the Tanzanian study.

Figure 1: Economic costs (year 2011 US\$) per fully-immunized girl by school location and vaccination



Source: Quentin W et al., 2012

Figure 2: Scaled-up class-based vaccination program: sensitivity analysis of incremental economic costs per fully-immunized girl (2011 US\$)



Source: Quentin W et al., 2012

Figure 2 shows that this study also found that costs per fully-immunized girl were lower for class-based delivery than for age-based delivery. Economic scaled-up costs per fully-immunized girl were US\$26.41, including the HPV vaccine at US\$5 per dose. Excluding vaccine costs, vaccine could be delivered at an incremental economic cost of US\$3.09 per dose and US\$9.76 per fully-immunized girl.

Proven strategies to increase coverage

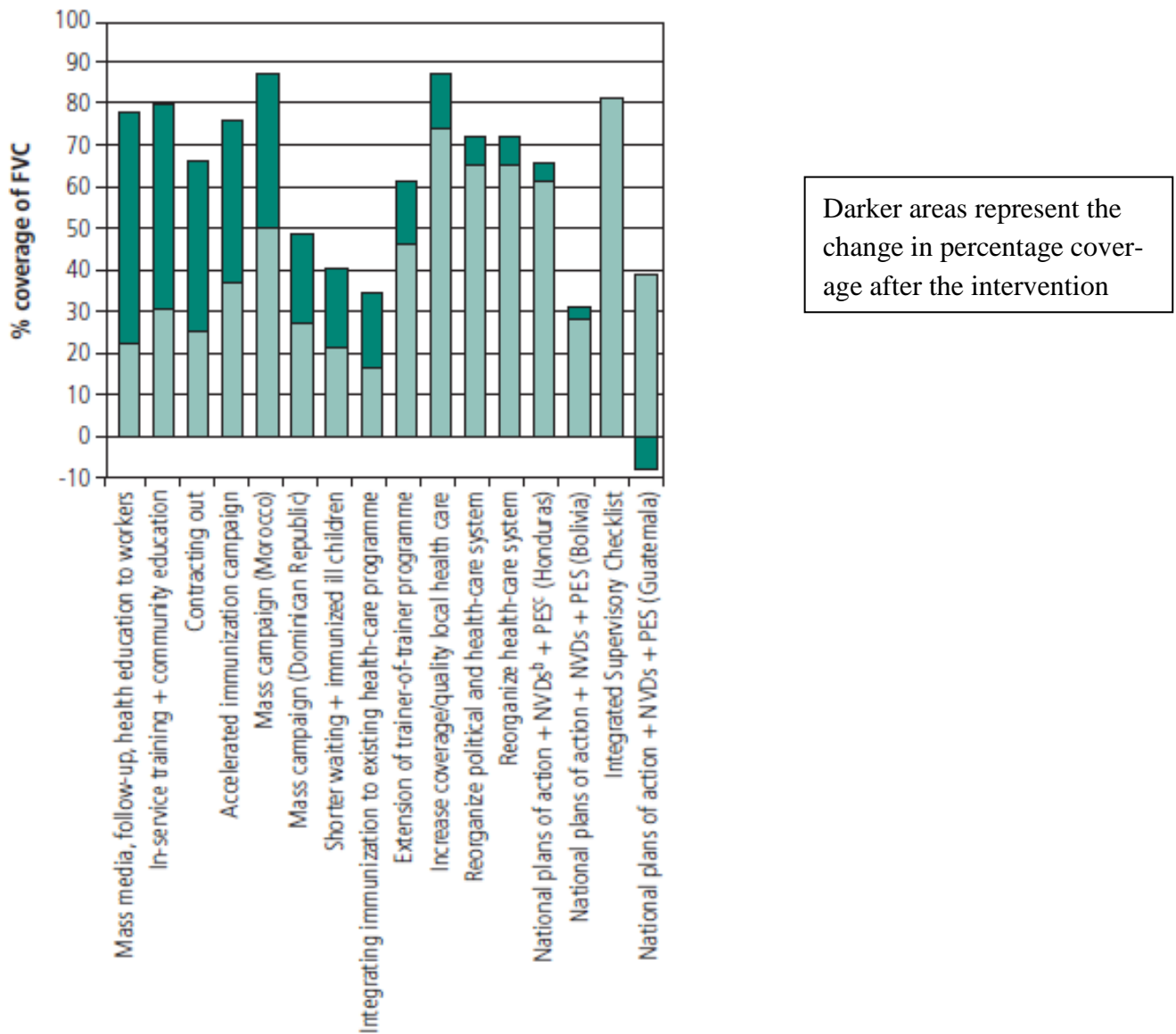
A systematic review of published literature had suggested that the most cost-effective strategies to increase coverage were **community health workers** and **door-to-door canvassing** and that the least costly were **peer training** and again door-to-door canvassing. However because there was little evidence on which the conclusions were drawn, the evidence of poor quality and the literature being old, most of it from the 1980s and with none of the interventions being formally evaluated, another systematic review basing on both published and unpublished work was done to build on it (6). The findings of this latter one are shown in figure 3 below. The figure shows that out of the 16 interventions considered, 14 increased the coverage of fully vaccinated children from an average baseline coverage of 44% (17–84) by an average percentage point increase of 20 some up to 55 percentage points.

The interventions with the highest impact on full coverage, that is with an increase of over 30% from baseline, were **health education campaigns, changes in provider or payer model, and mass campaigns**.

In two of the interventions, coverage fell- with the introduction of Integrated Supervisory Checklists in the Philippines, coverage fell by 0.2% while it fell by 7.5% with the introduction of the National Plan of Action in Guatemala.

Another systematic review whose objective was to evaluate the effectiveness of interventions strategies to boost and sustain high childhood immunization coverage in LMIC once the policy is in place, found that home visits and health education may improve immunization coverage (7). However the quality of evidence in this review was generally low. The authors concluded that interventions targeting patients or communities and the health system(including with immunization cards redesigned to act as patient reminders, health education, and home visits) may increase the coverage of vaccines. Furthermore the effect from these interventions may be increased if they are administered in combination rather than as single interventions. How sustainable the effect is over long periods was not clear from this review. An intervention that stood out in this study was evidence-based discussion that aims at knowledge translation to the community members – it was found that this may be more effective than conventional health education strategies.

Figure 3: Changes in the proportion of fully-vaccinated children (FVC) after the interventions discussed in the grey literature



Source: Batt K et al., 2004

A summary of how the different approaches to health education compared with each other is shown in table 2 below:

A systematic review to assess the effectiveness of **patient reminder** and **recall systems** in improving immunization rates, and to compare the effects of various types of reminders in different settings or patient populations concluded that patient reminders and recall systems in primary care settings are effective in improving immunization rates in developed countries (8). It found that reminding people to have vaccinations increased the number of people vaccinated, whether the people were due or overdue for vaccinations. The observed increases were both in children and adults and for all types of vaccines. However these increases were limited in urban adolescents. Furthermore the study noted that providing numerous

reminders was better than a single reminder, and reminding people on the phone was more effective than using letters through the post. It did not matter where the reminders were from, whether from the doctor or a general medical centre or even a public health unit. The limitation with this review is that the studies were mostly from developed countries and it is not clear if these findings would be the same for low income settings.

Table 2: Health education for improving coverage of child immunization in low- and middle-income countries

Patient or population: patients with improving coverage of child immunization in low- and middle income countries

Settings: low- and middle income countries

Intervention: health education

Outcomes	Illustrative comparative risks		Relative effect (95% CI)	Number of participants (studies)	Quality of evidence (GRADE)*
	Control	Health education			
Information campaign (Outcome measure: uptake of at least one vaccine; follow up: 12 months)	94 patients out of every 1000	134 patients out of every 1000 (range 90-190)	RR 1.43 (1.01 to 2.02)	1025 (1 study)	Moderate
Facility-based health Education (Outcome measure: DPT3 uptake; follow-up: 90days)	547 patients out of every 1000	645 patients out of every 1000 (Range 574-728)	RR 1.18 (1.05 to 1.33)	750 (1 study)	Low
Facility-based health education + redesigned card as a patient reminder (Outcome measure: DPT3 uptake)	547 patients out of every 1000	744 patients out of every 1000 (Range 667-826)	RR 1.36 (1.22 to 1.51)	750 (1 study)	Low
Evidence-based discussion Outcome measure: DPT3 uptake; Foll.-up: 12mths)	244 patients out of every 1000	529 patients out of every 1000 (Range 349-803)	RR 2.17 (1.43 to 3.29)	957 (1 study)	Moderate
Evidence-based discussion (Outcome measure:Measles uptake)	324 patients out of every 1000	528 patients out of every 1000 (Range 334-836)	RR 1.63 (1.03 to 2.58)	956 (1 study)	Moderate

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

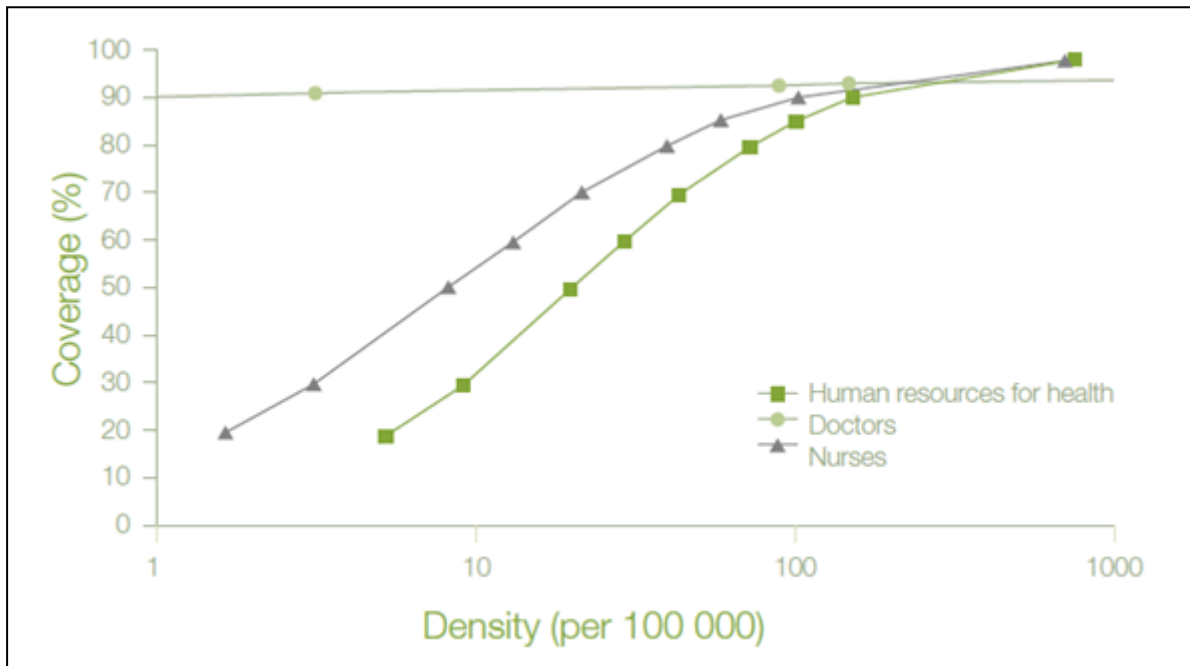
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

Figure 4 below illustrates how immunization coverage is affected by the presence and density of health workers. The World Health Organization highlighted that of the 57 countries worst affected by extreme shortages of health workers, 36 are in Africa, where AIDS and worker migration have depleted the health workforce and one of these is Uganda.

Figure 4: Effect of the density of health workers on immunization coverage



Source: WHO, 2009

Barriers to implementation

Barriers	Implementation considerations to mitigate identified barriers
<p>Access</p> <p>Inequity in access to immunization leads to a high degree of variability in coverage. 73% of the children currently unreached with three doses of DTP immunization live in just 10 countries, all in Asia and Africa (9). These unimmunized children live in:</p> <ul style="list-style-type: none"> • <u>isolated rural areas</u> without easy access to health facilities • <u>poor, densely populated urban areas</u> and informal settlements • among <u>displaced populations</u> that are on the move 	<p>Generally strengthen the health system with and by:</p> <ul style="list-style-type: none"> • Good health services - which deliver effective, safe, quality personal and non-personal health interventions to those who need them, when and where needed, with minimum waste of resources. • A well-performing health workforce - that works in ways that are responsive, fair and efficient to achieve the best health outcomes possible, given available resources and circumstances (i.e. there are sufficient staff, fairly distributed; they are competent, responsive and

<ul style="list-style-type: none"> • especially <u>difficult to reach areas</u> 	<p>productive).</p>
<p>Difficulty in delivery through an infrastructure and logistical support system that in many developing countries is characterized by</p> <ul style="list-style-type: none"> • poor vaccine stock management • poor vaccine handling and storage • high wastage • with the newer vaccines – some have non-standard characteristics i.e. single dose in pre-filled glass syringes as opposed to multi-dose vials – these require new vaccine management strategies and increased storage capacity, putting a huge strain on an already weak supply chain. 	<ul style="list-style-type: none"> • A well-functioning health information system is one that ensures the production, analysis, dissemination and use of reliable and timely information on health determinants, health system performance and health status. • To counter the several misconceptions, well-targeted information and social mobilization campaigns are needed to transform a community’s “passive acceptance” of immunization into a well-informed demand for vaccines that can protect their children against lifethreatening diseases. • Since fear of vaccines and immunization often stems from a lack of information, people need to know how safe a vaccine is and how it can reduce disease and deaths.
<p>Lack of information especially among the poorest populations. This also includes</p> <ul style="list-style-type: none"> • a lack of understanding about the importance of vaccines and immunization • the concept of an intervention that “helps healthy people to stay healthy” may be poorly understood • where parents lack a basic understanding of how vaccines work, children may be vaccinated once but fail to return for the required follow-up doses. 	<ul style="list-style-type: none"> • A well-functioning health system ensures equitable access to essential medical products, vaccines and technologies of assured quality, safety, efficacy and cost-effectiveness, and their scientifically sound and cost-effective use. • A good health financing system raises adequate funds for health, in ways that ensure people can use needed services, and are protected from financial catastrophe or impoverishment associated with having to pay for them. It provides incentives for providers and users to be efficient.
<p>Fear of immunization especially fanned by reports of adverse events that are suspected of being related to vaccines. With ever increasing and fast access to electronic information, unsubstantiated rumours about vaccines can rapidly circle the globe and undermine immunization services, sparking outbreaks of disease and untold</p>	<ul style="list-style-type: none"> • Leadership and governance involves ensuring strategic policy frameworks exist and are combined with effective oversight, coalition-building, regulation, attention to system-design and accountability. This comes amid growing concern that the current global financial and economic crisis may

deaths.	have an adverse effect on the funds available for development assistance, including for immunization.
<p>Cost</p> <p>The cost of the vaccine and its delivery is a major potential obstacle. With Uganda’s estimated population growth rate of 3.6% per annum, the growth of the immunization budget in real terms reduces significantly. This means that any increase in funding resources should be over and above the increase in the annual age cohort(s) targeted for HPV vaccination. A major obstacle is the volatile foreign funding. Should Uganda obtain GAVI funding support, issues of co-financing and financing of the HPV vaccination program beyond GAVI funding remains a major potential obstacle.</p>	
<p>Cultural barriers</p> <p>These may arise for a vaccine targeting only girls. From past experience, rumours that oral polio and TT vaccines in Uganda were actually an anti-fertility vaccines became widespread and were difficult to manage for some years.</p>	

Source: WHO, UNICEF, WB, 2009; Banura et al., 2012

Conclusion

The Ministry of Health is in the process of finalizing a national immunization policy. The policy’s successful implementation will be measured partly on how far its activities reach the target population - the coverage, which has been low in Uganda. With a comprehensive and wholesome draft policy in place, this paper has presented factors that policy makers will need to consider for implementation. These include the cost of immunization, strategies to improve coverage and potential barriers to implementation and their mitigating factors. With these the future of the policy would be more predictable with a well planned implementation strategy.

References

1. Andre FE, Booy R, Bock HL, Clemens J, Datta SK, John TJ, et al. Vaccination greatly reduces disease, disability, death and inequity worldwide. *Bulletin of the World Health Organization*. 2008;86(2):140-6.
2. World Health Organization. Global Health Observatory - Immunization. 2013 [cited 2013; Available from: <http://www.who.int/gho/immunization/en/>
3. John Hopkins Bloomberg School of Public Health. Decade of Vaccines Economics (DoVE). 2011.
4. Wilm Quentin, Fern Terris-Prestholt, John Chungalucha, Selephina Soteli, W John Edmunds, Raymond Hutubessy, et al. Costs of delivering human papillomavirus vaccination to schoolgirls in Mwanza Region, Tanzania. *BMC Medicine*. 2012;10:13.
5. PATH, CHDC, UNEPI. HPV vaccination in Africa: Lessons learned from a pilot programme in Uganda. Seattle: PATH; 2011.
6. Katherine Batt, J.A. Fox-Rushby, Marianela Castillo-Riquelme. The costs, effects and cost-effectiveness of strategies to increase coverage of routine immunizations in low- and middle income countries: systematic review of the grey literature. *Bulletin of the World Health Organization*. 2004;82:689-96.
7. Oyo-Ita A, Nwachukwu CE, Oringanje C, Meremikwu MM. Interventions for improving coverage of child immunization in low- and middle-income countries. *Cochrane Database of Systematic Reviews* 2011, Issue 7. Art. No.: CD008145. DOI:10.1002/14651858.CD008145.pub2.
8. Jacobson Vann JC, Szilagyi P. Patient reminder and recall systems to improve immunization rates. *Cochrane Database of Systematic Reviews* 2005, Issue 3. Art. No.: CD003941. DOI: 10.1002/14651858.CD003941.pub2.
9. WHO/UNICEF. WHO/UNICEF estimates of national immunization coverage. In: WHO vaccine preventable diseases: monitoring system Geneva: World Health Organization; 2008.



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The **Regional East African Community Health-Policy Initiative (REACH)** links health researchers with policy-makers and other vital research-users. It supports, stimulates and harmonizes evidence-informed policymaking processes in East Africa. There are designated Country Nodes within each of the five EAC Partner States.

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The **Evidence-Informed Policy Network (EVIPNet)** promotes the use of health research in policymaking. Focusing on low and middle-income countries, EVIPNet promotes partnerships at the country level between policymakers, researchers and civil society in order to facilitate policy development and implementation through the use of the best scientific evidence available.

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Conflicts of interest

None known.

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