Opinion

Vaccination Plans are not vaccination programs. Introducing the Country Vaccination Score, CVS

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The availability of adequate health care for all, from cradle to grave, should be as certain as food, water and clean air. To achieve this goal, vaccination plays a prominent role as it is unrivalled, compared with almost any other intervention, both concerning the magnitude of benefits to individual and public health, and with regard to its high benefit-cost ratio (1-3). With a current world population of almost 8 billion — well-connected and exposed to each other by trade and travel — living without routine vaccine-induced protection against diphtheria, pertussis, polio, hepatitis B, invasive Hib-diseases, rotavirus-diarrhea, pneumococcal diseases, measles, rubella and varicella would result in huge, avoidable suffering, deaths and costs. Despite these obvious advantages, vaccine uptake is incomplete or even critically low in many places. As one example, annual influenza epidemics cause billions of US $ in damage to the health and wealth of nations. Nevertheless, influenza vaccine uptake barely reaches 50% even in high-risk groups (4) (Health care use - Influenza vaccination rates - OECD Data). In low-and middle-income countries (LMIC), the causes of low vaccine uptake may be largely caused by a lack of resources: money to buy vaccines, set up for cold-chains and for other immunization logistics; or the availability of well-trained staff to implement what is desired and needed. In contrast, in resource-rich countries vaccine hesitancy, alternative medicine/homeopathy groups as well as well-organized anti-vaccine organization play crucial roles in prohibiting adequate public health services (5).

Viewing the low vaccine uptake globally, from a purely managerial point of view, the first question to ask is "Is the structure of national vaccination systems appropriate for optimal vaccine delivery?" Taking this perspective, WHO identified that National Immunization Technical Advisory Groups (NITAGs) play a crucial role. Unlike other medicines, vaccines are for the most part only used if there is a NITAG recommendation. Furthermore, the acceptance of such recommendations is based on their scientific quality and on the integrity of the respective NITAG. To this end, with support from WHO, The Global NITAG Network (GNN; Home | NITAG RESOURCE CENTER (nitag-resource.org)) was founded, defining six criteria for high-quality NITAGs and their members. These are: (1) formal written terms of reference; (2) a legislative or administrative basis for the advisory group; (3) core members from at least 5 areas of expertise; (4) meeting at least once annually; (5) distribution of the agenda and background documents for those meetings $\geq$1 week in advance; and (6) a requirement to disclose conflicts of interest. Since its foundation in 2016/2017, 172 of the approximately 193 to 195 countries on earth now have NITAGS; 121 of them meet the GNN criteria; 78 of them are GNN members.

Trusted, science-based recommendations from an independent body of the highest integrity is the sound basis for vaccine acceptance and delivery. But this is only the first step. The existence of a "vaccination plan" does not automatically imply running a successful "vaccination program". It has been shown that even with the existence of GNN-type NITAGs, there may still be a lack of implementation and a lack of the political will to put the plan into action (6, 7).

Therefore, following instructions from the "good manager´s toolbox", in general, any successful project relies on (1) defining goals, (2) creating a plan; (3) implementing the plan; and (4) evaluating the success of the plan. For a country's NITAG to achieve broad acceptance, the recommended vaccination must have clear goals that are communicated to the population, such as the elimination of disease; disease control to avoid hospital overload; cost-savings etc. Having a concise plan is a prerequisite for an action to achieve a maximum of success with least possible resources. One would doubt the seriousness of a manager if he did not implement necessary action and if he did not regularly measure success. Playing football without keeping score is nothing but practice. Countries with no valid and timely data on vaccine uptake and burden of disease data cannot document if and when they will achieve their goals. This results in a lack of public trust and lack of motivation to get vaccinated.

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Based on the above considerations, we have created 4 x 2 criteria to evaluate the managerial / structural ability of a country to successfully deliver high-quality vaccination services, the Country Vaccination Score (CVS); **Table 1**). The methods include internet-based research by experts in the field of vaccines and vaccination with proficiency in the respective local language. All of the points granted needed to be substantiated by a verifying source. All entries were validated by an independent reviewer. To date, the CVS working group has evaluated more than 40 countries and in addition, also summarized their political, cultural and healthcare situation (VacciNATION – Global Health Press (id-ea.org).

Knowing that the CVS has been evaluated in only an unrepresentative 15% of countries, no general conclusions can be drawn yet. Interestingly, however, some LMICs are very high-ranking, whereas some rich countries are at the low end of the list. This can be explained by the managerial support that the LMICs receive from WHO, PAHO, UNICEF and GAVI The Vaccine Alliance, all excellent managers who monitor success closely. The first impression is that a "lack of evaluation" appears to be a major issue in many resource-rich countries, as there is frequently little/no valid data on vaccine impact and vaccine uptake.

The authors of the CVS refrained from simply asking government officials for additional information as this likely would have biased our results toward higher scores. It is then possible that for single countries relevant information that would have resulted in a higher CVS was missed. On the other hand – as one country reviewer put it – "what governments write on paper may not always be what happens in real life", and "higher than real" scores may have been achieved for some countries. Thus, the CVS is not perfect, but the goal is to identify structural gaps independently so that national authorities can take the action needed to successfully run genuine vaccination programs increasing the access to, and uptake of vaccines around the globe. Future research may correlate the CVS with "vaccination success" data. This, however, appears to be a difficult task, as e.g. vaccine uptake data are often not reliable (e.g. if based on individual vaccination certificates only if they are provided) or if measurement is accomplished too late (school entry data measured as proxy for completeness of infant vaccination).

The CVS working group will regularly update the CVS scorecard and welcomes any comments and particularly any further insights and information from individual experts and from institutions and government officials.

For this purpose, an interactive platform has been created which allows room for discussion and the exchange of data, following the "plan, do, check, act" management method. The CVS working group appreciates the support from readers to evaluate one of the more than 150 countries without a CVS yet. For more information, please access: www.vaccination.org.

Note: Countries included to date are: Australia, Austria, Bangladesh, Belarus, Belgium, Brazil, Cameroon, Canada, Colombia, Democratic Republic of Congo, Denmark, Finland, France, Germany, Hungary, India, Indonesia, Iran, Italy, Kenya, Kazakhstan, Lithuania, Malawi, Mexico, Nepal, The Netherlands, Norway, The Philippines, Poland, Portugal, Romania, Slovenia, Republic of South Korea, Spain, Sweden, Switzerland, Syria, Uganda, United Kingdom, Ukraine, USA. The CVS working group is looking for experts from countries not included above.

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1) **Are there any vaccination goals and targets?**
   a. There are goals for future vaccine needs (e.g., over the next 3, 5 or 10 years).
   b. There is ≥1 specific, officially published and well-known national vaccination target to be reached by a specific date (e.g., measles elimination by end 2025).

2) **Is there a national vaccination plan?**
   a. There is one (and only one) plan published by a WHO-type NITAG.
   b. Pipeline vaccines are continuously reviewed pre-licensure by NITAG.

3) **Is there appropriate implementation of the NITAG plan?**
   a. There are clearly defined responsibilities and accountabilities for implementation of the NITAG plan with action in case of failure.
   b. The NITAG plan is regularly supported by government-funded national information campaigns.

4) **Is there a scientifically valid evaluation of implementation success?**
   a. There are up to date (≤ every 2 years) validated studies on vaccine-uptake, completion and compliance at age 2 years, before school entry, for adolescents and for those ≥65 years (some countries: ≥60 years).
   b. There is scientifically sound and timely (≤2 years) burden-of-disease data by age group on all vaccine-preventable diseases including relevant pipeline vaccines.

Table 1. *The Country Vaccination Score, CVS: Method for assessing a country´s structural s ability to successfully deliver vaccination services.*

References

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