Diagnosing the determinants of vaccine hesitancy in specific subgroups: The Guide to Tailoring Immunization Programmes (TIP)

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ABSTRACT

Despite relatively high vaccination coverage rates in the European Region, vaccine hesitancy is undermining individual and community protection from vaccine preventable diseases. At the request of its European Technical Advisory Group of Experts on Immunization (ETAGE), the Vaccine-preventable Diseases and Immunization Programme of the WHO Regional Office for Europe (WHO/ EURO) developed tools to help countries address hesitancy more effectively. The Guide to Tailoring Immunization Programmes (TIP), an evidence and theory based behavioral insight framework, issued in 2013, provides tools to (1) identify vaccine hesitant population subgroups, (2) diagnose their demand- and supply-side immunization barriers and enablers and (3) design evidence-informed responses to hesitancy appropriate to the subgroup setting, context and vaccine. The Strategic Advisory Group of Experts on Immunization (SAGE) through its Working Group on Vaccine Hesitancy has closely followed the development, implementation, use and evolution of TIP concluding that TIP, with local adaptation, could be a valuable tool for use in all WHO regions, to help address countries’ vaccine hesitancy problems. The TIP principles are applicable to communicable, noncommunicable and emergency planning where behavioral decisions influence outcomes.

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1. Introduction

Despite relatively high immunization coverage rates in the WHO European Region, challenges to ensuring protection of individuals against vaccine-preventable diseases and community protection persist. Protecting the fundamental public health gains made by immunization programmes in the region, and improving programme impact, are dependent on availability and quality of vaccination services as well as on individuals and communities: understanding the benefits and risks of immunization and the diseases prevented by vaccination; making evidence-informed choices; being encouraged to seek immunization services; taking responsibility to protect children, adolescents and adults, throughout the life course; and being sufficiently engaged and empowered to influence health service provision and to overcome barriers to vaccination. However, vaccine hesitancy by some individuals and communities, and a significant minority of health workers in the European Region, threatens the individual and societal ability to protect infants and children, and to prevent the health impacts of vaccine preventable diseases.

Addressing vaccine hesitancy is not a simple task, as a multitude of factors can potentially influence a person’s decision to seek out or accept vaccination for themselves or their child [1,2]. As hesitancy is not uniform across a population, analysis of vaccine uptake data can detect subgroups with lower than expected coverage rates, given available vaccination services [3]. These hesitant subgroups may be linked by geography, culture, socioeconomic and/or other factors but often, in the European Region, are not defined by their social determinants [4] but instead by behavioral factors and determinants categorized by complacency, confidence and/or convenience [1,2]. Thus the specific factors leading to hesitancy in the subgroup need to be identified so that the most appropriate intervention options can be applied and evaluated for effectiveness. Interventions will differ by subgroup, context, setting, vaccine(s), time, and resources.

2. The Guide to Tailoring Immunization Programmes (TIP)

2.1. Background

Given growing concerns about vaccine hesitancy in the region, in 2011 the European Technical Advisory Group of Experts on
Immunization (ETAGE) requested that the WHO/EURO Vaccine-preventable Diseases and Immunization (VPI) Programme develop tools to help countries address hesitancy more effectively[5]. Based upon pioneering work in this field of vaccinology, after extensive consultation, the response was the 2013 Guide to Tailoring Immunization Programmes (TIP), an evidence and theory based behavioral insight framework[6].

TIP was developed “to provide proven methods and tools that can help national immunization programs design targeted strategies that lead to increased uptake of infant and child vaccination, thereby increasing the immunization coverage rates and curbing the risks of vaccine preventable diseases in the region”[6].

TIP provides tools to (1) identify and prioritize vaccine hesitant populations and subgroups, (2) diagnose the demand and supply-side barriers and enablers for vaccination in these populations and (3) design evidence-informed responses to vaccine hesitancy appropriate to the setting, context and hesitant population. TIP is not a communication tool but rather a diagnostic guide to define and diagnose behaviourally related hesitancy determinants and propose appropriate interventions.

TIP is underpinned by behavioral insight methods[7,8], social marketing models[9] and the evidence-based Population Services International (PSI) Delta Social Marketing Process 7 Steps (Table 1)[10], which have proven successful in achieving behavioral change in many low income countries in health areas such as condom use and maternal child care[11]. Such behavioral insights recognize that the subjective experience of immunization and vaccine-preventable disease can be a legitimate source of knowledge to support appropriate design of user-friendly immunization services and vaccination delivery. While TIP is underpinned by social marketing, it is broader than this as it encompasses most aspects of the whole immunization process.

The Strategic Advisory Group of Experts on Immunization (SAGE) through its Working Group on Vaccine Hesitancy closely followed the development, implementation, use and evolution of TIP.

2.2. Application of TIP

In the WHO European Region, TIP has now been successfully applied in Bulgaria[12], Sweden[13–16], and the United Kingdom[14] to diagnose causes of hesitancy and develop targeted interventions for subgroups with lower than expected vaccine uptake. In Bulgaria, between 2009 and 2011 a serious measles outbreak with 24 deaths and 24,364 reported cases occurred, with many cases in unvaccinated Roma population children. TIP diagnostics revealed that for the Roma population, continuing the default intervention of increasing vaccine programme information campaigns was not likely to improve vaccine uptake in this vulnerable subgroup[12]. The factors affecting vaccination acceptance were not simple. For example immunization was getting lost amidst other parental and health-care provider priorities, expertise and experiences (Table 2)[12]. Based upon these and other factors determined using the TIP approach, three customized strategic solutions to address vaccine hesitancy among the Roma in Bulgaria were developed: (1) strengthen the number, role, reach and ability of health mediators to serve these vulnerable populations and support general practitioners; (2) increase the supply of accurate, trustworthy information on child vaccination and vaccine preventable diseases on the internet targeted to parents/caregivers, and (3) improve the quality of the health worker–parent/caregiver encounter (for details see Ref.[12]).

In Sweden, application of the TIP diagnostic tool to (a) Somali immigrants, (b) anthroposophic believers and (c) unregistered migrant communities has helped Sweden to better prioritize the immunization programme needs of each community by providing better insight into their preferences and requirements[15,16]. The United Kingdom also launched a TIP project to address vaccine hesitancy in the Orthodox Jewish communities in Greater London[12].

Subgroup segmentation of those who are vaccine hesitant can be seen in the examples from Bulgaria (e.g. the late child, the mobile child, the invisible child, the wary caregiver, the poor child[12]) and Sweden (e.g. within the anthroposophic group: conformers, pragmatists, attentive delayers, and promoters of natural immunity)[16]. Of note, these subgroups cut across many common profiles used to describe populations, such as socioeconomic status, ethnicity, and religion. In both countries, application of TIP led to customized solutions that specifically addressed the hesitancy problem with available resources. In some instances, a combination of policy, legal, and communications changes may be needed, once the specific hesitancy problems are identified.

More countries within the WHO European Region have expressed interest in using TIP. Recently, the Ministry of Health of Kazakhstan, where vaccine hesitancy is prominent in the major cities (Aстанa, Alматy), launched a TIP project to segment, profile, and target higher socio-economic, educated urban dwelling caregivers. Germany also recently initiated a TIP project to target hesitant parents/caregivers and providers in the southern region of Baden Württemberg. The influenza team at WHO/EURO has begun to adapt the same diagnostic framework for targeting health workers to drive demand for influenza vaccine (TIP-FLU)[17] with a case study under way in Montenegro.

WHO/EURO and the National Institute for Public Health and the Environment (RIVM) in the Netherlands are tailoring the TIP framework to address antimicrobial resistance (TAP), with development of a Guide to Tailoring Antimicrobial Resistance Strategies (TAP)[18]. This highlights how the principles of TIP can be applied to other communicable disease areas, where behavioral insight is required to better tailor programme responses.

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**Table 1**

<table>
<thead>
<tr>
<th>PSI Delta Marketing Planning Process 7 Steps that underlie the Tailoring Immunisation Programme[10].</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Situation Analysis analyzes the context in which the intervention operates in order to ensure selection of the most appropriate target group and behavior, and identify strategic priorities for the marketing plan.</td>
</tr>
<tr>
<td>2. Audience Insight means getting to know the target group as a real person – one with a face and a name – and one with aspirations and desires, not just as a set of demographics. Creating such profiles is a technique that has been used successfully by commercial sector giants such as Procter and Gamble.</td>
</tr>
<tr>
<td>3. Brand Positioning is the identification and promotion of the most important and unique benefit that the product/service/behavior stands for in the mind of the target group. This is the emotional “hook” upon which one can hang the marketing strategy.</td>
</tr>
<tr>
<td>4. Marketing Objectives specify what you want to achieve during the marketing plan, ensuring it stays focused and true to the evidence. This also facilitates easier monitoring of intervention progress.</td>
</tr>
<tr>
<td>5. The Four Marketing “Ps” – Product, Price, Place and Promotion – specify what strategies one will use to achieve the marketing objectives.</td>
</tr>
<tr>
<td>6. The Research Plan details how the intervention will monitor and evaluate implementation of the plan, as well as identifying and prioritizing any information gaps about the target group and how they will be explored.</td>
</tr>
<tr>
<td>7. An integrated Budget and Work Plan specify how financial resources will be allocated among the 4Ps and help managers allocate human and other resources as well as monitor implementation.</td>
</tr>
</tbody>
</table>
Table 2: Examples of TIP-determined factors contributing to vaccine hesitancy among the Roma population in Bulgaria [adapted from reference \([12]\)].

<table>
<thead>
<tr>
<th>For caregivers (mothers)</th>
<th>For health-care providers (general practitioners (GP))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time and expense with repeated visits to GP</td>
<td>Imbalance of health-care service demands and physician numbers leads to high workload and brief visits</td>
</tr>
<tr>
<td>GP visits are brief, not easy for mother to ask questions</td>
<td>Immunization does not compete well against other priorities for GP time and attention</td>
</tr>
<tr>
<td>Mothers have limited understanding of vaccination schedule</td>
<td>GPs lack the time and skills to ensure clear and comprehensive communication of vaccination information to these vulnerable caregivers</td>
</tr>
<tr>
<td>Often basis for GP visit is that infant or child is ill, thus focus is on illness not immunization. Vaccine may be postponed</td>
<td>GPs are expected to provide reminders for vaccination but this is often not done</td>
</tr>
<tr>
<td>Infant/child may not be documented/registered with the National Health Insurance Fund (NHIF).</td>
<td>Low perceived financial compensation for vaccination and clinical work in general in the face of high level of demand</td>
</tr>
<tr>
<td>Mobile population means limited relationship with health system mediators and GPs. If not registered with NHIF, not able to access health-care services and GPs will not attend to them</td>
<td>Need for more outreach services</td>
</tr>
<tr>
<td>Health system mediators/navigators who support this vulnerable population</td>
<td>Need for more community-level support and mediation</td>
</tr>
<tr>
<td>inadequate numbers of them</td>
<td>inadequate numbers</td>
</tr>
<tr>
<td>not knowledgeable about immunization so unable to answer queries by mothers</td>
<td>not knowledgeable about immunization so unable to answer queries by mothers and by this community</td>
</tr>
</tbody>
</table>

2.3. Developing TIP globally

TIP does not support the use of one or more specific intervention strategies, but focuses on segmentation of the population to determine the subgroup(s) at risk, the diagnosis of the relevant barriers and enablers of vaccine uptake in the subgroup(s) and development of an intervention tailored to the findings, context and available resources for each subgroup. SAGE concluded that the principles upon which TIP is based are applicable in all WHO regions and that the experiences with TIP in the European Region suggested that TIP will be a valuable tool for diagnosing the determinants of vaccine hesitancy in subgroups in many settings, although local adaptation will be necessary. Presentations to the Working Group by experts from Africa, India and Pakistan highlighted the growing importance of and need for community-directed research to better understand the determinants of hesitancy. In late 2013, the Working Group proposed that four major areas be addressed in order to move TIP to the global level:

1. Rework and simplify the document by region or by level of income (high, middle, lower income countries) to better fit end users’ needs. This is being addressed in part by the development of the more practical immunization manager field guide.
2. Develop resources/expertise/training to support implementation of TIP in WHO regions and countries. A cadre of TIP facilitators is needed. A training course held in June 2014 by WHO/EURO was an initial step in addressing this gap.
3. Ensure that each WHO region has regional expertise and tool kits adapted to its region to support TIP implementation and facilitator training, which may need to be tailored to fit high, middle and low income settings in different regions. Experience is needed to determine how training can best be adapted to local needs.
4. Develop a means of sharing the lessons learned from TIP interventions and outcomes, both successes and failures, across regions and globally.

A major issue constraining wider rollout of TIP is that it requires knowledgeable facilitators with sophisticated expertise. To address this gap, a TIP consultant training course was held in June 2014 [13] and more are planned. In parallel, with support from the United States Centers for Disease Control and Prevention (CDC), a practical TIP field guide for national immunization managers is being developed as a companion to the current 2013 TIP Guide. This more user-friendly document will support the use of TIP in settings where personnel and financial resources are scarce. The 2013 TIP Guide is also being updated, with new examples included, and a more accessible step-by-step approach to implementation incorporated. This document is expected to be issued in August 2015.

WHO, supported by the United States CDC, aims to expand the use of TIP globally. One of the first steps hereby was to consider the application of TIP in sub-Saharan Africa. In order to magnify the potential for success of field-testing of TIP there, links have been made to social-behavioral change programmes that exist at several universities in South Africa.

3. Working Group observations/conclusions on TIP and endorse by SAGE

The Hesitancy Working Group noted that beyond adaptation of TIP for global use, WHO/EURO experiences in addressing vaccine hesitancy with TIP need to be evaluated through accumulation and sharing of lessons learned and development of best practices for application of TIP to different subgroups, contexts, vaccines and settings. Application of TIP in other areas also needs to be evaluated.

The Working Group observed that the success of TIP in Europe underlined how application of research evidence from behavioral sciences, economics, the medical humanities, psychology, and neuroscience can help decision-makers understand vaccine acceptance decisions. These insights can better equip decision-makers and programme managers in tackling vaccine hesitancy. TIP explores the determinants that influence vaccination behavior, and it emphasizes the importance of diagnosing both the demand- and supply-side factors, and emphasizes the value of audience research. SAGE agreed with this conclusion.

The applied behavioral insight methods that underpin TIP make positive behaviors easier in the segmented population where the appropriate interventions are targeted. TIP makes changes that encourage healthy choices (the object of health promotion) for the hesitant individual and community. These TIP principles might also be applicable to other communicable and noncommunicable diseases where patient behavioral choices and context markedly influence outcomes; for example prevention of transmission of some sexually transmitted diseases, and management and monitoring of some aspects of adult onset diabetes. Similarly, responses to outbreaks and emergencies might also be improved with application of these methods as a rapid and accurate understanding of the populations affected is essential for effective strategy planning.
[19]. With application of these methods, governments can shift away from traditional, expensive programmatic and/or regulatory interventions to lower cost, more subtle, more effective, targeted interventions that have positive impacts in the selected problem subgroup, whether for immunization, communicable or noncommunicable disease control, outbreak control or emergency disaster planning. In times of fiscal constraint, such directed lower cost ways to support the needed behavioral change mean governments can deliver better services with better outcomes with fewer resources.

The Working Group concluded that given this breadth of potential for benefit, the integrated knowledge and skills of sociologists, behavioral psychologists, anthropologists, experts in social marketing and communication as well as specific disease experts need to be brought together to form integrated core behavior insight groups both at WHO headquarters and in the regional offices. Initially, these core groups would provide insights into vaccine hesitancy and driving demand for vaccine(s) and then potentially expand work in other areas, including both communicable and noncommunicable diseases.

This new approach, exemplified by TIP, can help encourage people to adopt healthier lifestyles and choices. The TIP experiences do not suggest that behavior change techniques combined with system changes that support these changes are the panacea for solving every health-related behavioral problem, but do show how the approach can often lead to effective, non-intrusive, cost-effective ways of encouraging behavioral change that can result in better health outcomes for individuals and for society. SAGE accepted the conclusion of the Working Group on Vaccine Hesitancy that TIP is an important strategy to address vaccine hesitancy that should be pursued [20].

4. Conflict of interest statements

The LSHTM research group “Project to monitor public confidence in Immunization Programs” has received research funding from Novartis as well as funding from GSK to host a meeting on vaccine confidence. Heidi Larson has done consulting on vaccine confidence with GSK.

None of the other authors had any potential conflict of interest. Some of the authors are World Health Organization staff members. The opinions expressed in this article are those of the authors and do not necessarily represent the decisions, official policy or opinions of the World Health Organization.

Appendix. SAGE Working Group on Vaccine Hesitancy

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