TAILORING IMMUNIZATION PROGRAMMES (TIP) in the Federation of Bosnia and Herzegovina, Bosnia and Herzegovina

FINAL REPORT
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This report has been produced by Sanjin Musa (Institute of Public Health of FBiH), Cath Jackson and Katrine Bach Habersaat (WHO Regional Office for Europe). Colleagues from the TIP Core Group commented on earlier drafts: Mirsad Smjecanin (Institute of Public Health of FBiH), Aida Kulo and Venesa Skrijelj (the Medical Faculty, University of Sarajevo).
INTRODUCTION

Routine vaccination uptake in the Federation of Bosnia and Herzegovina (FBiH) (one of two entities in Bosnia and Herzegovina (BiH) with the Republika Srpska, and Brcko District of BiH), has been steadily declining since 2014. In 2018 reported coverage for the third dose of the diphtheria-tetanus-pertussis containing vaccine (DTP3) was 72.8%, and for the first dose of the measles-mumps-rubella vaccine (MMR 1) was 68.4% (1) – below the 95% target for national coverage stipulated in the European Vaccine Action Plan (2). In 2019 a measles outbreak reported 1332 cases in FBiH. Alongside outbreaks in nearby countries, including Germany, Italy, Romania and Serbia, these data serve as constant reminders of the consequences of low vaccination uptake (3). Furthermore, Bosnia and Herzegovina is considered at high risk of sustained polio transmission following importation due to its sub-optimal vaccination coverage (4).

A growing body of global evidence has shown that the underlying causes of suboptimal vaccination uptake are complex, context-specific and vary by time, place and vaccine (5-7). This means that local evidence is needed to develop an effective response (8). Back in 2017, little was known about the reasons for the suboptimal vaccination uptake in FBiH to inform strategies. To address this, the Institute for Public Health of the FBiH commenced a World Health Organization (WHO) Tailoring Immunization Programmes (TIP) project (9,10).

TAILORING IMMUNIZATION PROGRAMMES (TIP)

Drawing on proven behavioural and community insight approaches and social science research techniques, the TIP approach (9,10) offers a structured process through which to
1) define and describe sub-optimally vaccinated population groups and prioritize between them;
2) diagnose barriers and drivers to vaccination through social science research and stakeholder engagement to obtain behavioural and community insights; and
3) develop effective and cost-effective strategies to increase vaccination coverage.
A generic process is illustrated in Figure 1; however, each process is shaped according to the need and the context where it is applied.

The TIP approach applies a broad perspective on barriers and drivers to vaccination, drawing upon a modified COM-B system (10,11) (Capability-Opportunity-Motivation-Behaviour) as a framework for changing behaviour. This system identifies the inter-linked factors of capability, opportunity (social and physical) and motivation as influencing vaccination behaviours. See Figure 2 for a description of the COM factors.

TIP IN FBiH

The aim of this TIP project was to identify the factors related to the declining and sub-optimal routine vaccination uptake in FBiH to inform a long-term strategy to increase vaccination uptake and avoid future disease outbreaks. The objectives were to:

1. identify, describe, segment and prioritize between the population groups who are sub-optimally vaccinated;
2. understand the capability, opportunity and motivation barriers and drivers to positive vaccination behaviours among priority target groups;
3. use insights to develop tailored, effective and cost-effective strategies to increase vaccination uptake.

The phases of the FBiH TIP are described in this report.
Figure 1. TIP process (9)
The TIP project was led by Sanjin Musa from the Institute of Public Health of FBiH. He was supported by the TIP Core Group made up of colleagues from the Institute of Public Health of FBiH (Mirsad Smjecanin), the Medical Faculty, University of Sarajevo (Aida Kulo, Venesa Skrijelj), the WHO Regional Office for Europe (Katrine Bach Habersaat, Cath Jackson) and the WHO Country Office (Mirza Palo, Victor Olsavzky).

To ensure coordination and input from key stakeholders, a TIP Advisory Group was established with formally appointed members:

- Goran Čerkez and Zlatan Peršić, Federal Ministry of Health, FBiH
- Mirsada Mulaomerović and Davor Pehar, Institute for Public Health of FBiH
- Fatima Čengić, UNICEF Bosnia and Herzegovina
- Amra Junuzović, Health Centre of Sarajevo Canton
- Jelena Kalinić, Society for Science Advocacy “Science and the World”

The Advisory Group met in each phase of the TIP project.
Figure 2. Modified COM-B system – a framework for understanding vaccination behaviour (9,10)

**Capability**
**INDIVIDUAL**
- Knowledge
- Skills, trust in own skills
- Resilience, stamina, will power, surplus energy
- Physical fitness, ability

**Opportunity**
**CONTEXTUAL**
- **Physical**
  - Access, affordability, availability of vaccination
  - Convenience, appeal, appropriateness of vaccination
  - Rights, regulation, legislation
- **Social**
  - Structural efficiency
  - Availability of information
  - Social, cultural demands, support
  - Social, cultural cues, norms, values

**Motivation**
**INDIVIDUAL**
- Attitudes, perceptions, risk assessment
- Intentions
- Values, beliefs
- Emotions, impulses, feelings
- Confidence, trust
PHASE 1: SITUATIONAL ANALYSIS

The objectives of this phase were to 1. obtain an overview of existing evidence regarding vaccination in FBiH and in specific population groups; and 2. obtain stakeholder input and support.

REVIEW OF DATA AND EXISTING STUDIES

Recent (2016) vaccination coverage and disease outbreak data and published papers on measles, mumps and rubella outbreaks were reviewed (12-14). Other relevant reports and published papers were also examined (15-22). These explored the situation of women and children, the status of Roma families, bottlenecks of routine vaccination, the impact and effectiveness of immunization on vaccine-preventable diseases, vaccine confidence and anti-vaccination sentiment.

CONSULTING STAKEHOLDERS

Two workshop discussions were held with stakeholders attending European Immunization Week 2017 events. Discussions focused on the coverage data - susceptible areas and populations; and ideas about barriers and drivers to positive vaccination behaviours for parents and health workers in FBiH.

Workshop 1 was held on 24 April 2017, with 24 participants from the following organizations: Federal Ministry of Health, Public Health Institute of FBiH, WHO, UNICEF, NITAG, Committee for Communicable Diseases, Medical Faculty University of Sarajevo and the Agency for Quality Improvement and Accreditation in Healthcare in FBiH.

Workshop 2 was held on 25 April 2017 with 87 participants from: primary health care centers, public health institutes and services (pediatricians, nurses, epidemiologists and other public health staff).

SWOT ANALYSIS

Based on the review of data and stakeholder consultation, a preliminary SWOT analysis (strengths, weaknesses, opportunities and threats) of the vaccination programme in FBiH was conducted (see Table 1).

The clear conclusion from the review of data, stakeholder consultation and SWOT analysis was that more knowledge was needed to understand:

- which children are sub-optimally vaccinated;
- the reasons why they are sub-optimally vaccinated;
- which barriers and drivers affect parents’ childhood vaccination behaviours;
- which barriers and drivers affect health workers’ childhood vaccination behaviours.
PHASE 2: RESEARCH

The objectives of this phase were 1. to prioritize target groups, and 2. plan and conduct one or more research studies.

PRIORITIZING TARGET GROUPS

Given the lack of the available data available, the decision was taken to not select specific target groups at this time. Instead, to conduct research with a mix of parents and health workers.

Table 1. SWOT analysis

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
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<tbody>
<tr>
<td>Childhood vaccinations are provided free of charge</td>
<td>Low and declining coverage rates</td>
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<tr>
<td>Centralized procurement and distribution of vaccines</td>
<td>Lack of understanding of who the sub-optimally vaccinated groups are and their reasons</td>
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<td>Regulatory practices (e.g., NRA, NITAG) are harmonized with EU/EEA standards</td>
<td>Health workers may not be routinely vaccinating children</td>
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<tr>
<td>Increased budget secured for vaccine procurement in 2016/17</td>
<td>Shortage of pediatricians</td>
</tr>
<tr>
<td>Vaccine delivery costs are integrated with pediatric/family medicine services sharing uncertainty of financing</td>
<td>Low knowledge of immunization, vaccine safety and AEFIs among health workers.</td>
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<td></td>
<td>Mandatory system is not being imposed, and no formal mechanisms exist for recording refusals.</td>
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<td></td>
<td>Weak infrastructure, lack of staff and a decentralized health system</td>
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<td></td>
<td>Lack of co-ordination among different administrative levels to implement the law</td>
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<tr>
<td></td>
<td>Limited procurement power due to small contracted amounts of vaccine doses</td>
</tr>
<tr>
<td></td>
<td>Risk of costly disease outbreaks and of circulation of poliovirus following importation.</td>
</tr>
<tr>
<td></td>
<td>Monitoring and evaluation system needs improving</td>
</tr>
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<td></td>
<td>Lack of legislation in the private sector regarding data reporting</td>
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<tr>
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<td>Health Insurance Funds are limited</td>
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<td></td>
<td>Vaccine supplier’s base is “narrow”</td>
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<tr>
<td></td>
<td>Hesitancy related to safety concerns and growing anti-vaccination communication and online presence</td>
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OPPORTUNITIES

- Good level of political will and collaboration between key stakeholders at entity level
- Enthusiasm for research capacity building
- UNICEF and WHO will support (re) introduction of a vaccine planning process (vaccine needs, vaccine forecasting, budgeting)
- Planned introduction of computerized monitoring and evaluation system
- Build on existing programme that works with Roma communities
- Commitment to delivering routine vaccination training for health workers

THREATS

- Risk of costly disease outbreaks and of circulation of poliovirus following importation.
- Monitoring and evaluation system needs improving
- Lack of legislation in the private sector regarding data reporting
- Health Insurance Funds are limited
- Vaccine supplier’s base is “narrow”
- Hesitancy related to safety concerns and growing anti-vaccination communication and online presence
PLANNING AND CONDUCTING RESEARCH

Three research studies were conducted May 2017 to October 2019. Ethics approval for each study was secured from the Federal Institute of Public Health Ethics Committee.

1. Interview study with 38 primary care health workers to identify barriers and drivers to positive childhood vaccination behaviours
2. Patient file study of children’s records in primary care centres (1800 children aged 24-35 months, 1800 children aged 12-23 months) to assess vaccination coverage, timeliness and drop-out and compare these with official administrative coverage estimates; and to identify associations between child/parent characteristics and vaccination uptake
3. Interview study with 22 parents (from the patient file study) to identify barriers and drivers to positive childhood vaccination behaviours

Full reports and executive summaries are available from Sanjin Musa (s.musa@zzjzFBiH.ba).

All three studies have been published (23-25). Findings of the two interview studies were presented by Sanjin Musa at the Bosnian-Herzegovinian American Academy of Arts and Sciences Conference in June 2018, the Global Immunization Meeting in Kigali (Rwanda) in June 2018 and the Rotavirus symposium in Minsk (Belarus) in August 2018.

A summary of each of the study findings and conclusion is presented below. The barriers and drivers to positive vaccination behaviours identified in the two interview studies are organized by the modified COM factors (Figure 2) (9,10).

Interview study with health workers (23)

Significant, complex and inter-related capability, opportunity and motivation drivers and barriers to health workers’ positive childhood vaccination behaviours were uncovered. Very few differences were evident between high and low coverage primary care centres or across different professional roles (doctors/nurses).

**CAPABILITY:** Drivers included awareness of the risks of low vaccination coverage, regular use of the Rulebook and Order, knowledge of how to advise parents on mild side effects and recognition of the importance of good communication with parents. Key barriers were the use of false contraindications to postpone vaccination and poor skills in tailoring vaccination communication with parents.

**PHYSICAL OPPORTUNITY:** Drivers were having sufficient time for administering vaccination and good availability of vaccines. Several barriers were evident: lack of implementation of mandatory vaccination meaning health workers did not routinely report refusals, no uniform recall and reminder system or system for detecting under-vaccinated children, staff shortages and lack of time to discuss vaccination with parents.

**SOCIAL OPPORTUNITY:** A driver for health workers was feeling supported by the federal and cantonal system in case of an adverse event. A barrier was the pressure from some parents who believe they can choose if their child is vaccinated because this is time of social change, with the doctor-patient/parent relationship moving away from a paternalistic approach.

**MOTIVATION:** Drivers were a belief in the value, safety and effectiveness of childhood vaccination and seeing that as health workers they have an important role to play. Barriers were a fear of being blamed for
adverse events (hence agreeing to using false contraindications to postpone vaccination) and a tendency to blame low vaccination coverage on external factors e.g. anti-vax movement.

**CONCLUSION:** These multifaceted barriers potentially contribute to the suboptimal vaccination coverage in FBiH. Important new, detailed insight was captured from this study to inform the tailoring of interventions in the next intervention development phase.

**Patient file study (24)**

**VACCINATION COVERAGE, TIMELINESS AND DROP-OUT:** Vaccination coverage calculated from the patient files was consistent with administrative coverage levels for BCG, DTP and MMR, and lower for HepB (range 64% to 90% excluding vaccinations administered at birth). All were considerably lower than regional targets thus confirming suboptimal vaccination coverage.

Just over half the children aged 12-23 months (59%) were fully vaccinated (excluding MMR).

An assumption that anti-vaccination sentiment prevails among parents was not confirmed; only 2% of children were not vaccinated at all. Only 8% of children were unvaccinated except for BCG and HepB1 (administered at birth).

An assumption of parent concerns for the MMR vaccine was confirmed with low uptake, MMR1 vaccine compared to DTP1 vaccine was less accepted (65% versus 86%) and more delayed (4 months versus 2 months).

Significant challenges related to delays (three doses of DTP and HepB completed at 8-9 months instead of 6 months) and drop-out before three doses completed (26% DTP, 34% HepB).

**ASSOCIATIONS BETWEEN THE CHILD/PARENT CHARACTERISTICS AND VACCINATION UPTAKE:** The odds of being fully vaccinated were three times higher for a child living in a rural area compared to an urban area. A child of Roma affiliation was less likely to be fully vaccinated although this should be viewed with caution as based on a small sample (36/3600). No other child/parent characteristics (child’s gender, child’s birth order, mother’s/father’s age, and education) were significantly associated with vaccination coverage.

**CONCLUSION:** This study provided new detailed data on childhood vaccination patterns and revealed important vaccine and urban/rural differences. This insight is vital for targeting interventions in the next intervention development phase.

The two qualitative studies offer potential health worker and parent explanations for the suboptimal coverage, delays and drop-out. Another potential explanation relates to the global shortage of acellular pertussis vaccine from 2014-16 when whole-cell pertussis vaccine was temporarily reintroduced. A debate at that time related to DTP safety concerns may have had wider impact on health workers and parent vaccine confidence, with the change in the immunization schedule (temporary postponing DTP3) leading to delays.
Interview study with parents (25)

Parents were classified according to their child’s record in the patient file study as parents of a fully vaccinated child (n=6), a delayed/partially vaccinated child (n=9) or an unvaccinated child (n=7).

As with the health worker study, significant, complex and inter-related capability, opportunity and motivation drivers and barriers to parents’ positive childhood vaccination behaviours were uncovered. Some differences were evident across different parent groups and urban/rural settings.

**CAPABILITY**: Drivers were a basic knowledge of vaccine-preventable diseases and the purpose of vaccination as well as awareness of the vaccination schedule. Barriers were specific to each parent group. Parents with unvaccinated children seemed less aware of risk information (risk of catching a disease, the seriousness of the diseases) or their risk interpretation was different. Some parents of partially/delayed children acknowledged their own poor skills in organizing their child’s vaccination.

**PHYSICAL OPPORTUNITY**: Location of the health facility, travel costs and waiting time were not perceived as influencing attendance for vaccination. Mandatory vaccination was supported by parents of fully and delayed/partially vaccinated children. A key barrier was not receiving a reminder to bring the child for vaccination. Barriers specific to urban parents were a lack of “official” information from their health facility and a perceived occasional shortage of vaccines. Urban parents with partially/delayed vaccinated children were frustrated with inflexible appointment times. Accessing credible information on the internet was a driver.

**SOCIAL OPPORTUNITY**: Discussing vaccination with a trusted health worker was a driver for parents with fully partially/delayed vaccinated children. Whilst those with unvaccinated children were more likely to be unhappy with their child’s pediatrician. Most parents discussed vaccination with friends and family, those with unvaccinated children were more selective in who they did this with. Circulating rumours about adverse events were a barrier to vaccination.

**MOTIVATION**: Parents of fully vaccinated children and most with partially/delayed vaccinated children held positive attitudes to vaccination, trusted their health workers and intended to vaccinate in the future. Negative attitudes and lack of trust on health workers were barriers for parents with unvaccinated children. Only two were adamant they would never vaccinate their child.

**CONCLUSION**: These barriers and drivers offer new detailed insight to inform the tailoring of interventions to different parent groups in the next intervention development phase.

**Summarizing**

The research identified important patterns in vaccination coverage as well as complex and inter-related barriers and drivers to health workers’ and parents’ positive childhood vaccination behaviours. This insight was then taken into Phase 3 to inform the targeting and tailoring of interventions.
PHASE 3: INTERVENTION DESIGN

The objectives of this phase were 1. to design and plan an intervention, 2. to develop a monitoring and evaluation framework, and 3. to consult stakeholders to obtain their input and support.

TRANSLATING OUTCOMES INTO INTERVENTIONS

Following completion of the health worker interview study, the TIP core team attended a 4-day workshop from 23-26 April 2018. The purpose of this workshop was to complete a series of TIP exercises to translate the research findings into potential interventions. The exercises are designed to ensure that ideas for interventions are grounded in the research evidence and informed by theory. In short, the key barriers and drivers to positive childhood vaccination behaviours identified from the health worker interviews were agreed by the team and linked to their corresponding COM factor. Types of interventions that are known to be effective for each COM factor were then presented to the team who came up with ideas for the health workers. These ideas were prioritized according to their potential impact on vaccination coverage and feasibility of implementation.

The same process was undertaken with the findings of the parent interview study in a 3-day workshop (27-29 November 2018) with the TIP core team.

The final list of key barriers and drivers to positive vaccination behaviours for health workers and parents and associated ideas for interventions are presented in Table 2.

ENGAGING STAKEHOLDERS

The study findings and the ideas for interventions were presented and discussed with stakeholders at an event organized for European Immunization Week (25 April 2018). Approximately 40-50 people attended from the following organizations: the WHO Country Office, UNICEF, the Federal Ministry of Health, NITAG members, Federal and Cantonal public health institutes, Committee for Infectious Diseases, International Organization for Migration, World Bank in FBiH, two embassies; and pediatricians from primary care centres. The members of the TIP Advisory Group were present at this event.
Table 2. Key barriers to positive vaccination behaviours and associated Intervention ideas

<table>
<thead>
<tr>
<th>Key barriers and drivers</th>
<th>Intervention ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Parents (particularly those with partially vaccinated children who are vaccine hesitant and those with unvaccinated children) have concerns and questions about vaccination e.g., safety and quality of vaccines, contraindications, motives of the pharmaceutical industry. They want skilled communication by trusted health workers to address their concerns, strengthen their confidence in vaccination and develop resilience to negative media, social media and social network messaging. However, some health workers lack good knowledge of vaccinology and safety, and have poor vaccination communication skills, finding conversations with refusing parents particularly challenging.</td>
<td>Educate and train health workers on vaccinology and communication skills  • Prepare a course with standalone modules  • Offer face-to-face and online delivery  • Link to accreditation system and license renewal  • Consider adapting existing training programmes e.g., WHO and ESPID (European Society For Paediatric Infectious Diseases) Wiser Immunizer Course, John Hopkins Center for Communication programs Interpersonal Communication for Immunization Package</td>
</tr>
<tr>
<td>2 There is no uniform and effective system for inviting children for vaccination, scheduling appointments and sending out reminders; or for detecting and following up with children who miss vaccination. Parents would value a formal reminder about their children’s vaccination. This is particularly important for a sub-group of the parents with partially vaccinated children who struggle with scheduling vaccination appointments.</td>
<td>Implement a consistent system across primary care centres  • Update the vaccination checklist for health workers to include a prompt to write the date of next vaccination including follow-up on postponed vaccinations in a child’s vaccination/health insurance card  • Introduce a vaccination card for parents in a form of a nicely illustrated baby book with vaccination calendar, vaccination dates, child’s weight, height, teething, feeding etc.  • Streamline paper-based systems  • Move to an IT based system in the future which can send SMS reminders, i.e. develop a unique vaccine software for the FBiH in a long run (ensuring the use of the same IT systems in different cantons)  • Develop, promote and regularly update an app for parents which includes reminders and other services to address the needs</td>
</tr>
</tbody>
</table>
| 3 | A sub-group of the parents with partially vaccinated children, mostly in urban areas, are frustrated with limited appointment times for vaccination. | • Encourage primary care centres to increase the convenience of vaccination services by offering extended opening hours with early morning/late afternoon appointments, drop-in vaccination sessions and whole days allocated to vaccination  
• Have specialist primary care vaccination centres with specialist staff and extended opening hours |
| 4 | Some health workers use false contraindications to postpone vaccinations. This is prompted by pressure from parents and perceptions of a lack of support, supervision and monitoring at Cantonal and Federal level for AEFIs.  
Some health workers also lack knowledge of the law, order and rulebook. | Provide support to health workers for AEFIs and communicate this support  
• Strengthen risk communication mechanism (identify who, what and how will they communicate)  
• Develop written procedures for the protection of health workers in the case of AEFIs  
• Engage key organizations e.g., Chamber of Physicians, Society of Pediatrics, Trade Unions to give support in case of AEFI  
Improve accessibility of legal documents  
• Shorten and simplify  
• Send documents and updates via email as well as making it available on the internet |
PHASE 4: POST TIP

IMPLEMENTATION, MONITORING AND EVALUATION

Since the workshops in 2018, three interventions have been implemented with some preliminary evaluation. Further information on these interventions and evaluation is available from Sanjin Musa: s.musa@zzjzFBiH.ba.

Interpersonal communication for immunization training

To improve vaccination conversations between health workers and parents (Barrier 1, Table 2), the UNICEF Country Office in Bosnia and Herzegovina and Serbia, in collaboration with UNICEF Regional Office and relevant ministries and institutes in Bosnia and Herzegovina and Serbia, developed a set of training modules and materials on inter-personal communication and communication for immunization (IPC/I). These built on a training package developed by UNICEF and Johns Hopkins Center for Communication Programs (https://ccp.jhu.edu/projects/interpersonal-communication-for-immunization-package/) and other training packages developed in Europe and the Central Asia region.

The training package comprised six modules: professional and technical aspects of immunization, understanding behaviours and barriers, active listening for a better understanding of parents, responding to health workers’ and parents’ needs, communication during immunization and interpersonal communication with communities. The training techniques were PowerPoint presentations, exercises, work in small groups, role-plays, and lecture discussions. A handbook was also distributed.

A five-day training of trainers on IPC/I was delivered on September 2018 in Belgrade, with participants from Bosnia and Herzegovina and Serbia. IPC/I trainers from FBiH were Dr Sanjin Musa, Dr Blaško Topalović, Dr Merima Nokić-Čolaković, Dr Amra Junuzović, Dr Belma Krdžalić-Zečević, Dr Jadranka Mumin and Dr Borko Rajić. One and half day trainings were delivered nine times in six cities in FBiH in 2018/19. A total of 219 health workers, pediatricians, doctors (residents) and nurses working in primary care centres, from all cantons of FBiH attended.

IPC trainings in Sarajevo and Fojnica, 2019

Participants of the training completed pre- and post-tests anonymously, originally designed for the training (not validated) by the John Hopkins Center for Communication Programs. The questionnaires included 19 close-ended questions and 4 open-ended questions to assess knowledge and attitudes on vaccination and interpersonal communication. After completion of the training, participants showed improvement in knowledge on 4/4 questions and positive changes in attitude on 14/19 questions.
A sub-sample of 10 participants from the first three trainings were randomly selected for a short interview a year after attending the training. Most agreed that the training had been useful for their everyday practice, particularly for guiding conversations with hesitant parents. They felt less stressed and more confident although conversations and relationships with refusing parents remained challenging.

**Distribution of educational materials to health workers in primary care centres**

To update health workers’ technical knowledge and so improve vaccination conversations between health workers and parents (Barrier 1, Table 2), educational material on vaccine-preventable diseases and vaccination was distributed in 2019 via routine meetings/workshops to 175 doctors including pediatricians working on immunization in primary care centres. The material was produced by the European Society for Paediatric Infectious Diseases and translated into the local language. Further distribution is currently on hold due to the COVID-19 pandemic.

**Mobile application “My Calendar of Immunization”**

In May 2019, the Institutes for Public Health of FBiH and the Republic of Srpska in collaboration with UNICEF BiH launched a mobile application “My Calendar of Immunization” for parents. This app provides the immunization schedule, tracks a child’s vaccination status and sends notifications for immunization (seven days before the appointment) and a reminder 30 days later if the appointment is missed. It therefore addresses Barrier 2 (Table 2). To date the app has been downloaded by 8870 users.

Images from the “My Calendar of Immunization” app
IMPACT OF THE INTERVENTIONS

While no definite causal inference can be made between the new insights, the subsequent interventions and the vaccination uptake, some vaccination rates developed positively in 2019, breaking a steady trend with declining rates (see Figures 3 and 4) (1).

![Figure 3](image1.png)

**Figure 3.** Coverage for DTP1 and DTP3 2014-2019

![Figure 4](image2.png)

**Figure 4.** Coverage for MMR1 and MMR2 2014-2019

Unfortunately, all TIP project activities stopped in 2020 due to the global COVID-19 pandemic, and as a secondary effect of this, a decrease in routine immunization coverage was seen. A testament to the impact of the pandemic on routine vaccination behaviours can be found in a behavioural insights survey (26) conducted in FBIH in June 2020 with a representative sample of the population: 49% indicated that they had avoided going to the doctor with issues that could be postponed, e.g. vaccination or a check-up.
**NEXT STEPS**

Before the TIP project in FBiH, very limited local data on which children were vaccinated, and on barriers and drivers to childhood vaccination behaviours were available to inform strategies, interventions and communications.

Since then, the COVID-19 pandemic has posed overwhelming challenges to the childhood vaccination programme. Concerted effort will be needed in FBiH to:

1) get back on track with positive trends for routine vaccination uptake;

2) recover and catch up on those that missed vaccination during the pandemic; and

3) to ensure high COVID-19 vaccination uptake.

The significant, complex and inter-related capability, opportunity and motivation drivers and barriers to positive childhood vaccination behaviours uncovered in this study will be critical insights informing the strategies to reach these goals.

Targeted and tailored strategies are now being developed to ensure COVID-19 vaccination demand and acceptance. Post-pandemic, the same will be done for routine vaccination. The intervention ideas listed above are still valid and can be tailored to the new situation if and when resources are available. As part of this, partners and a broad stakeholder group will be engaged and consulted, and a resource mobilization effort will be initiated to ensure sufficient funds for the realization of the theory and evidence-informed interventions suggested as an outcome of the TIP project in FBiH.
REFERENCES


The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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Latvia
Lithuania
Luxembourg
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WHO/EURO:2022-4774-44537-63060
World Health Organization Regional Office for Europe
UN City, Marmorvej 51
DK-2100 Copenhagen Ø, Denmark
Tel.: +45 45 33 70 00
Fax: +45 45 33 70 01
Email: eurocontact@who.int
Website: www.euro.who.int