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# Matrix of strategic recommendations for immunization of health workers

## Matriz de recomendações estratégicas para a vacinação dos trabalhadores de saúde

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**ABSTRACT | Background:** Health workers are at high risk of exposure to contagious diseases, many of which might be prevented through vaccination. According to the Brazilian labor legislation, vaccination is a right of workers and an obligation for employers. **Objective:** To develop a matrix of strategic recommendations relative to the vaccination status of health workers as a function of the risks to which this occupational group is exposed. **Methods:** Qualitative study performed at a Health Basic Unit in November and December 2016. We held three workshops with an average of 22 participants and following a problematization method based on the Maguerez arc approach. The data collected in the workshops were recorded on a field notebook. **Results:** The selected method helped the participants gain insights the process of illness and healthcare. The workshops resulted in a matrix of recommendations of strategies to orient and monitor immunizations for health workers, including: information on vaccinations recommended for health workers, vaccination status updates and occupational health surveillance. **Conclusion:** The present study provides grounds for occupational healthcare as concerns the vaccination status of the participants and other health workers. The resulting strategic recommendations aim at improving the vaccination status of health workers and thus reduce the risk of diseases preventable through immunizations, which might be a reason for sickness absenteeism, and even of indefinite sick leave.

**Keywords |** occupational health; vaccination; immunization schedule; methodology; nursing.

**RESUMO | Introdução:** Os trabalhadores de saúde estão sob risco de exposição a doenças contagiosas, muitas delas imunopreveníveis. A imunoprevenção ocorre por meio da vacinação, sendo um direito dos trabalhadores e um dever das instituições empregadoras, conforme legislação trabalhista brasileira. **Objetivo:** O objetivo deste estudo foi construir uma matriz de recomendações estratégicas diante da situação vacinal de trabalhadores de saúde, dados os riscos a que tais profissionais estão expostos. **Método:** Trata-se de pesquisa qualitativa, realizada em uma Unidade Básica de Saúde (UBS), entre novembro e dezembro de 2016. Foram realizadas três oficinas, com participação média de 22 trabalhadores por oficina. Utilizou-se a Metodologia da Problematização com aplicação das etapas do Arco de Maguerez. As oficinas foram registradas em um diário de campo. **Resultados:** Essa metodologia possibilitou a compreensão dos participantes sobre o processo de adoecer e o cuidado com a saúde. As oficinas subsidiaram a construção da Matriz de Recomendações, que apresenta estratégias para orientar e monitorar a vacinação dos trabalhadores de saúde, como: informações sobre as vacinas indicadas aos trabalhadores de saúde; atualização do esquema vacinal; e a vigilância da saúde do trabalhador. **Conclusão:** Considera-se que esta pesquisa subsidia o cuidado em saúde do trabalhador diante da situação vacinal dos participantes e de outros trabalhadores de saúde. Tais recomendações estratégicas visam à melhoria da cobertura vacinal dos trabalhadores de saúde, contribuindo para minimizar o risco de adoecimento por doenças imunopreveníveis, que podem causar absenteísmo para o tratamento, ou até mesmo o afastamento do trabalho por tempo indeterminado.

**Palavras-chave |** saúde do trabalhador; vacinação; esquemas de imunização; metodologia; enfermagem.

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## INTRODUCTION

In addition to other types of work accidents, health workers are also exposed to occupational hazards which favor contamination and accidents involving body fluids. Sharps injuries are considered the most dangerous, because they are potentially able to transmit several pathogens, including the human immunodeficiency virus (HIV) and the hepatitis B and hepatitis C viruses, which are the most commonly involved in these incidents[1].

The main means to prevent virus transmission are immunization and adequate post-exposure care, which are thus fundamental components of infection prevention and workplace safety programs[1].

In a study performed with 265 nursing professionals at University Hospital of Santa Catarina, Brazil, the influenza vaccination coverage was 49.8% in 2009, 92.4% in 2010 and 95.4% in 2011, the latter two being considered exceptional by comparison to the current global scenario[2]. According to the authors, these outcomes were the result of educational actions implemented as part of institutional policies and a permanent concern with continuing education for workers. Actions did not merely focus on the specific tasks of each group of employees, but were included within a broad scoped view of worker healthcare aiming at maintaining their state of health and preventing diseases[2].

In another study performed in Minas Gerais, Brazil, to assess hepatitis B vaccination coverage, among 762 health workers who responded the questionnaire, 52.5% reported to have received all three scheduled doses[3]. The authors thus concluded that the prevalence of vaccination was low and that the results of their study pointed to the relevance of acquiring accurate knowledge on the risks associated with lack of vaccination against hepatitis B during undergraduate education[3]. Indeed, this subject has paramount importance, since chronic hepatitis B infection affects about 257 million people worldwide, the main complications of which are cirrhosis and hepatocellular carcinoma[4]. About 887,000 people die every year in consequence of infection with the hepatitis B virus[4].

The World Health Organization[4] considers hepatitis B an occupational hazard with serious impact on health workers. However, such impact can be prevented through vaccination, which is safe, efficacious and easily accessible.

Although hepatitis B vaccination is available to workers since 1992 in Brazil, and the national production of the vaccine is self-sufficient, the number of virus carriers is still considerable, probably due to exposure before the immunobiological agent became available[1]. In any case, all workers require the due care.

As a function of the aforementioned considerations, a reflection on healthcare strategies targeting the vaccination status of health workers is necessary. The reason is that immunizations have been demonstrated to be efficacious and effective for the control of infectious diseases, and that the protection acquired by workers extends to their patients and families.

These considerations were the main reason to design a study focusing on the vaccination status of health workers. The research question thus was: what strategies would workers suggest relative to their vaccination status?

To answer this question we established the following aim: to develop a matrix of strategic recommendations in regard to the vaccination status of health workers.

## METHODS

We selected the qualitative approach for the present study, because it enables analyzing the perception of individuals relative to some problem or situation, suggesting possible solutions and achieving an understanding of personal experiences[5].

To accomplish the intended aim, data collection was attended by educational actions based on the problematization method known as the Maguerez arc, which consisted of workshops held at a Health Basic Unit (HBU) in Curitiba, Parana, Brazil. This particularly HBU was selected because it holds weekly staff meetings, a condition that facilitated holding the sessions. To hold the workshops we obtained authorization from the district director and the local health authority. The staff of this HBU is composed of four physicians, three dentists, five nurses, 16 nursing technicians, four oral health technicians, one oral health assistant, one administrative employee and 16 community health agents.

Data collection and educational actions took place in November and December 2016. We scheduled four sessions on the same dates as those of the HBU staff

meetings and during the participants' working hours. In a preliminary meeting we explained the study aim and objectives, as well as the topics which would be analyzed. The subsequent meetings consisted of workshops which were conducted according to the various steps of the Maguerez arc method. As per the inclusion criteria, participants were workers under the civil servant regime allocated to the selected HBU; we did not consider any exclusion criterion.

The number of participants was 22, 25 and 19 in the first, second and third workshops, respectively. While none of the eligible workers refused participation, the number of participants varied as a function of sick leaves, vacation or other reasons. Therefore, absences were spontaneous and did not interfere with the method dynamics.

In the first meeting we invited the HBU employees to participate in the workshops, and they read and signed an informed consent form. In this meeting we provided explanations on the study aims, objectives and methods.

Each workshop lasted about 60 minutes. The principal investigator assumed the role of moderator to guide and provide support to the participants in their reflection and discussions, in addition to helping them compare lived experiences, while avoiding leading questions or comments. Thus the investigator provided information, dispelled doubts and facilitated reflection[6].

In addition to the principal investigator-moderator, also a nurse participated as observer in sessions, whose tasks were to analyze and record reactions, the group work process, limitations, nonverbal communication and participants' statements, as required by the selected method. Having an observer in all the meetings was necessary as a function of her dynamic role, as recommended in the literature[7].

After the end of each workshop, the principal investigator and the observer discussed their impressions to reach a consensus, particularly in regard to the group work process, to avoid drawing premature conclusions. The data were then recorded on a field notebook, including the investigator and observer's impressions and information provided by the participants, which were the basis to the develop the matrix of strategic recommendations. The data were analyzed according to the Maguerez arc method, resulting in a synthesis of the objectives and results of each meeting.

According to Afonso[6], a workshop is a modality of psychosocial intervention that might take place in variable settings — educational, community, clinical or social policy. Workshops involve more than data collection, as they sensitize participants to the subject of interest and afford them an experience of the multiple versions and meanings of some subject[7].

We selected a problematization method for the workshops, because this approach compels participants to face and reflect on reality, inquire about the possible reasons of current events and what they see as problematic, and adopt a reflective and critical attitude until finding and executing an action likely to change the ongoing situation in some measure[8].

The problematization method we applied is based on the so-called Maguerez arc, developed by Bordenave and Pereira[9], which includes five steps:

1. observation of reality;
2. identification of key-points;
3. theorization;
4. hypotheses for solution;
5. application into practice.

This method was adequate for the purpose of the present study, because it stimulates reasoning, the development of intellectual skills, learning, the mobilization of social potentials and teamwork. It afforded the participants conditions to understand the relationship between theory and practice[9].

We only developed the first four steps of the Meguerez arc method, as shown in Figure 1[9]. The last step, application into practice, was presented as proposal to the Municipal Secretariat of Health for implementation of the resulting strategic recommendations.

The present study complied with the ethical principles stated in the National Health Council Resolution no. 466, from 12 December 2012[10]. The workshops began only after the study was approved by the research ethics committees of Federal University of Parana, ruling no. 1,604,958, and the Municipal Secretariat of Health, ruling no. 1,647,713. The participants received information on the study nature, objectives and methods, confidentiality, anonymity and their right to withdraw consent at any time. The present study had no external funding sources and the authors state they have no conflict of interest.

## RESULTS AND DISCUSSION

We conducted three workshops based on the problematization method according to the Maguerez arc approach, as shown in Chart 1.

### WORKSHOP #1: OBSERVATION OF REALITY AND IDENTIFICATION OF KEY-POINTS

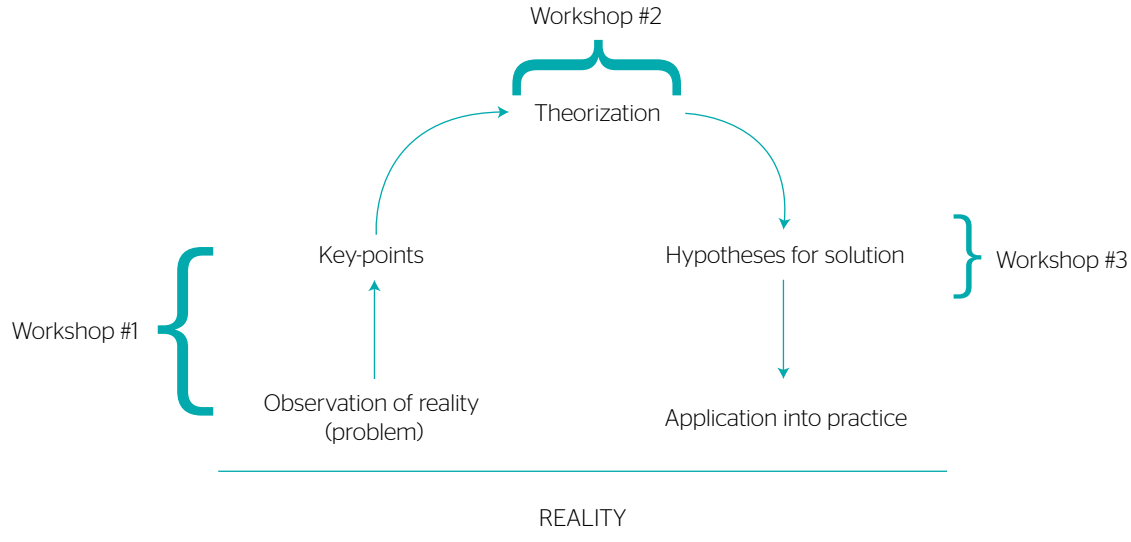
Workshop #1 was devoted to the steps of observation of reality and identification of key-points. Observation of reality began by presenting a problem, i.e. a part of reality, for the participants to develop a general view of the subject of interest[9]. The participants were thus led to look at a given situation and describe all its aspects[9].

The principal investigator described data relative to the actual vaccination status of all health workers in the health district to which the participating HBU belongs. The participants were then called to reflect on these data.

The role of the observer was to record the participants' comments, and guide and facilitate their discussion to ensure that the matrix of recommendations would be designed in compliance to the method adopted. It should be noticed that the observer oriented the participants to focus on the topics intended for each individual workshop.

As a result, the participants discussed problems related to non-vaccination among health workers, including: lack of institutional orientation, lack of knowledge of the vaccination schedule, fears, forgetting to get vaccinated, non-inclusion of health workers in influenza vaccination campaigns and lack of commitment of workers to their own health care. This initial reflection provided the grounds for the next step, that consisted in identifying key-points, i.e. the main points of the problem of interest, those which once changed are likely to solve it[9]. The key-points thus identified were: orientation on vaccinations recommended for workers, need for occupational health surveillance agencies to call the attention of workers to the vaccine they need to get, and campaigns to update the vaccination status of workers.

The key-points identified by the participants agree with recommendations by the Centers for Disease Control and Prevention (CDC)[11], i.e. implementing educational actions relative to vaccines indicated for health workers in association with other modalities of intervention, such as annual vaccination campaigns, e.g. against influenza. The CDC also suggest reviewing vaccination records on such occasions, as well as for institutions to implement catch-up vaccination programs and reminder/recall systems[11].




Source: adapted from Bordenave and Pereira[9].

**Figure 1.** Steps of the Maguerez arc method developed in the three workshops, Curitiba, Parana, Brazil, 2016.

Some participants stayed a little longer after the end of the workshop to discuss with the principal investigator and the observer doubts about their vaccination status. This was a result of their reflection on reality and the data provided in the workshop, because in spite of their technical knowledge, the participants did not have any knowledge about the subject discussed and manifested surprise in the face of the afforded information.

This situation had been previously mentioned to us by the district and HBU managers, the reason being that health workers have not yet understood the true need to keep vaccination up-to-date, as we could establish following analysis of the records corresponding to workshop #1 and the doubts raised by the participants.

The scientific literature on the problematization method observes that by promoting reflection and acknowledgement of the actual health situation in their area, a will to promote, protect and recover the health of others is awakened in participants[12]. Reflection might give rise to insight and learning to improve the workers' adherence to vaccination, with consequent reduction of the evident occupational risk to which they are exposed.

## WORKSHOP #2: THEORIZATION

Theorization, i.e. the third step of the method, was the focus of workshop #2, in which the participants were led to find a theoretical explanation for the problem of interest through the analysis of studies[8]. The key-points were thus analyzed in the light of available theories and research to provide grounds for solutions held to be applicable to the problem under analysis[9].

The aim of this step was to provide scientific grounds to necessary changes relative to vaccination. For this purpose, we distributed didactic materials on immunizations for health workers for the participants to read and discuss. The principal investigator moderated the discussions between subgroups and sought to dispel their doubts to facilitate reflection.

Some subgroups focused on the elucidation of aspects which emerged from the analysis of the didactic materials provided, given that they did not have any knowledge of the subject under review. Other subgroups requested additional information on the vaccines the participants ought to get. All doubts were elucidated based on scientific studies selected for this step of the study.

Still during this workshop the participants discussed their everyday work in its actual context, and the need to change the ongoing situation as a means to solve problem situations, including: lack of institutional orientation, lack of knowledge about the vaccination schedule, fears (of reactions to vaccines, of needles, of pain), forgetting to get vaccinated, non-inclusion of health workers in vaccination campaigns, and lack of commitment to their own health care.

The result of this workshop was a higher level of understanding of the ongoing situation and of the need to change

**Chart 1.** Summary of workshops and outcomes, Curitiba, Parana, Brazil, 2016.

| Workshop #1 | Workshop #2 | Workshop #3 |
|---|---|---|
| 22 participants:<br>- 4 physicians<br>- 2 dentists<br>- 3 nurses<br>- 10 nursing technicians<br>- 2 oral health technicians<br>- 1 administrative employee | 25 participants:<br>- 3 physicians<br>- 2 dentists<br>- 4 nurses<br>- 13 nursing technicians<br>- 2 oral health technicians<br>- 1 administrative employee. | 19 participants:<br>- 2 physicians<br>- 2 dentists<br>- 3 nurses<br>- 9 nursing technicians<br>- 2 oral health technicians<br>- 1 administrative employee |
| Content:<br>Maguerez' arc steps 1 and 2: observation of reality and key-points | Content:<br>Maguerez' arc step 3: theorization | Content:<br>Maguerez's arc step 4: hypotheses for solution |
| Outcomes:<br>- Reflection on the actual vaccination status of health workers<br>- Identification of key-points | Outcomes:<br>- Reflection on and understanding of the actual situation and strategies to change it | Outcomes:<br>- Formulation of occupational health strategies targeting immunizations |

Final outcome: Development of a matrix of strategic recommendations relative to the vaccination status of health workers.

individual behaviors and of institutional educational and divulgation actions relative to vaccinations recommended for health workers.

Theorization contributed for the participants to acquire knowledge on the subject of interest and afforded conditions to ground conscious decision making, taking the benefits and risks of vaccination into account, for the purpose of health promotion and to improve their quality of life. The provided information was processed and assimilated, leading to changes in the participants' behavior[13].

## WORKSHOP #3: HYPOTHESES FOR SOLUTION

Workshop #3 was devoted to the fourth step of the method, in which participants are requested to put hypotheses for solution forward, which are then confronted to the identified key-points and problems[9]. The aim of this step, therefore, is to find solutions for the previously identified problem situations and key-points.

Each subgroup was given a table to be filled, containing one of the keywords mentioned in workshop #1, to wit: orientation, campaigns and reminds. Each subgroup formulated hypothesis for solution relative to the keywords, which were entered in the table according to headings: who (who should implement the suggested strategy), where (place where it should be implemented) and how. Chart 2 describes the results obtained in workshop #3[14].

The strategies suggested by the participants corroborate the results of a study conducted in Canada, according to which health promotion and preventive actions, such as campaigns, with focus on either education or vaccination alone led to minimal changes in the vaccination rates. The authors therefore recommended combining education and divulgation strategies with measures to facilitate access to vaccination to achieve effective results[15].

Making vaccination available to workers is another measure needed. For this purpose, health institutions should divulgate, and train professionals for, procedures to prevent exposure to biological materials, design preventive and health promotion programs targeting health workers, provide training and health education, and implement medical control, records and surveillance of diseases[16]. For health promotion and preventive actions to be effective, changes are needed in behaviors, attitudes and practices among health workers and service managers[17].

At the end of the study, we found that most participants were unaware of the relevance of vaccination in general, and of the vaccines needed for their present and future protection in particular, even when their vaccination records were up-to-date and well kept. In turn, the participants' understanding of the relevance of the vaccination status improved as a function of the method selected for the workshops. With this, also the participants' awareness of the actual situation improved, and they were stimulated to reflect critically on the problem of interest, as well as on possible actions to change the ongoing state of affairs.

The principal investigator behaved as mediator; she helped dispel doubts on how to fill tables, and intermediated in the discussions held by the various subgroups, and the group as a whole, in regard to the formulation of the final table.

The strategies suggested by the participants served as basis to formulate a "Matrix of Strategic Recommendations Relative to the Vaccination Status of Health Workers," which is the final result of the present study. The matrix is divided into three parts, according to the key-points identified by the participants (orientation, campaigns and reminds) as shown in Chart 3[14].

Part 1 — divulgation of information on vaccinations recommended for health workers — corroborates the results of a study that described educational factors which influence adherence to health protection programs, including vaccinations for health workers, particularly educational level, training and continuing education[18].

Therefore, orientation should be provided to students and health workers, with emphasis on the advantages of vaccination and their possible side effects to demystify them.

Part 2 — campaigns for vaccination status updating — complements the first one by recommending campaigns to update the vaccination status of health workers. The reason is that isolate actions targeting education or divulgation alone have poor efficacy to improve the adherence to vaccination[2]. In turn, combination

of educational and divulgations actions with measures to facilitate access to vaccination might potentiate the results of strategies[2].

Part 3 — occupational health surveillance — corroborates the results of a study performed in Bahia, Brazil[19], which point to the need for continuous commitment to

**Chart 2.** Step 2 of the Manguerez arc method—formulation of hypothesis for solution, based on the identified key-points (orientation, campaigns and reminds), Curitiba, Parana, Brazil, 2016 (n=19).

| Key-point mentioned by the participants: orientation |
|---|
| Key-point as decoded by the principal investigator: Information on Vaccinations Recommended for Health Workers |
| Who?<br>- Epidemiological surveillance agencies; Occupational Health Reference Centers; vaccination centers; occupational health and human resources departments |
| Where?<br>- Occupational health departments (pre-employment and periodic medical examinations); Health Basic Units; workplace; job orientation meetings |
| How?<br>- Lectures<br>- Workshops<br>- Dynamic updates<br>- Educational materials<br>- Focus on specific vaccinations for health workers, with explanations of the corresponding benefits and risks (including room to dispel doubts) |
| **Key-point mentioned by the participants: campaigns** |
| Key-point as decoded by the principal investigator: Vaccination Update Campaigns |
| Who?<br>- Vaccination centers; occupational health departments; Health Basic Units; epidemiological surveillance agencies; Occupational Health Reference Centers; Municipal Secretariats of Health |
| Where?<br>- Health Basic Units; workplace; occupational health departments |
| How?<br>- Setting specific dates for updating the vaccination status of health workers<br>- Vaccination schedule monitoring<br>- Inclusion of all health workers in campaigns independently from their field of activity |
| **Key-point mentioned by the participants: reminds** |
| Key-point as decoded by the principal investigator: Occupational Health Surveillance |
| Who?<br>- Local coordinator; occupational health departments; Occupational Health Reference Centers; human resources department; health districts; Municipal Secretariats of Health |
| Where?<br>- Health Basic Units; occupational health departments; workplace |
| How?<br>- During campaigns<br>- Reviewing vaccination records<br>- During pre-employment and periodic medical examinations<br>- Memos requiring vaccination status update<br>- Reviewing vaccination records in staff meetings<br>- Development of spreadsheets to monitor the vaccination status of health workers |

occupational health surveillance to overcome barriers to immunization, and thus ensure actual protection to individuals and groups[19].

The development of a matrix of strategic recommendations relative to the vaccination status of health workers described here was based on scientific literature and the results of the present study. The suggested strategies seek to improve actions targeting immunizations for health workers.

Step five of the Maguerez arc method, i.e. application into practice, consists in actual application of the produced knowledge and hypotheses formulated to solve the targeted problem[8]. We presented the strategies relative to immunizations for health workers formulated in the present study to the Municipal Secretariat of Health for future implementation.

## CONCLUSION

The problematization method enabled formulating a matrix of strategic recommendations relative to the vaccination status of health workers, inasmuch as it evinced critical reflection on the subject of interest and a more accurate understanding of immunizations as a means for the participant's own protection and that of coworkers and

**Chart 3.** Matrix of strategic recommendations relative to the vaccination status of health workers, Curitiba, Parana, Brazil, 2016.

| |
|---|
| **Provision of information on vaccinations recommended for health workers** |
| Performance of educational campaigns targeting health workers, based on active and dynamic methods, including strategies to enhance motivation and acknowledgment of relevance, and elucidating the risks to which this population is daily exposed. Topics: vaccination schedule for health workers, benefits and risks of vaccinations |
| Provision of orientation to health workers in regard to the relevance of immunizations during job orientation integration and pre-employment and periodic medical examinations |
| Preparation and distribution of educational materials with orientation on vaccinations recommended for health workers, specific aspects of each vaccine, and explanations of the benefits and relevance of protection through immunization |
| Preparation of a vaccination record form for health workers including the list of recommended vaccinations to facilitate the visualization of past and future and enabling scheduling future vaccinations |
| **Vaccination update campaigns** |
| Promotion of vaccination update campaigns targeting health workers |
| Performance of vaccination campaigns in the workplace, thus facilitating access to immunizations and improving adherence |
| Distribution of vaccination record forms for health workers |
| **Occupational health surveillance** |
| Health Basic Units should be required to fill a spreadsheet with the vaccination schedule of each employee and send them to the health district authorities every two months. This action will facilitate the control of the vaccination status of workers and the design of strategies for improvement and adjustment as per need |
| The vaccination control spreadsheets should be sent to occupational health departments every two months, naming the workers who are up to date and to monitor those with missing vaccinations |
| Active search of workers with missing vaccinations based on the internal control spreadsheets. Workers refusing vaccinations should sign an institutional refusal form |
| Health workers should be requested to produce their vaccination record forms at pre-employment and periodic medical examinations. Vaccinations should be indicated as per need and/or according to schedule. When workers fail to produce the vaccination record form, they should be oriented to bring them to the following medical appointment |
| Preparation of reminders listing required vaccinations to attach to online pay stubs |

other individuals with whom they interact in daily practice. These aspects reinforce the relevance of paying considerable attention to continuing education as a continuous strategy to acquire knowledge grounded on the actual situation at healthcare facilities.

The application of the Manguerez arc method to the workshops contributed to the accomplishment of the study aims, since it led to the formulation of relevant strategies. Therefore, the aim of the present study — to design a matrix of strategic recommendations relative to the vaccination status of health workers — was accomplished.

The present study might provide grounds to occupational healthcare as concerns the vaccination status of health workers. The resulting strategic recommendations aim at improving the vaccination status of workers, and thus minimize the probabilities of acquiring diseases and consequently missing work days for treatment of conditions preventable through immunizations.

The participants manifested interest in the implementation of the suggested strategic recommendations. Also noteworthy are their motivation to participate in the study and the value of the collective development of a matrix of strategic recommendations for vaccination of health workers by a multidisciplinary group. We believe that the present scientific study enabled participants to reflect on their own health care.

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