ORIGINAL RESEARCH ARTICLE

Italian healthcare workers' perspectives on strategies to enhance vaccination coverage: A national cross-sectional survey

GIOVANNI EMANUELE RICCIARDI[1,2,3], ANGELA ANCONA[1,2], RITA CUCINIELLO[1], GRETA CHIECCA[3], ANTONELLA CASTAGNA[3], CRISTINA RENZI[1,4], GIOVANNI REZZA[1], MATTEO MORO[3]

[1]School of Medicine, Vita-Salute San Raffaele University, Milan, Italy; [2]PhD National Programme in One Health Approaches to Infectious Diseases and Life Science Research, Department of Public Health, Experimental and Forensic Medicine, University of Pavia, Pavia, Italy; [3]San Raffaele Hospital, Milan, Italy; [4]Research Department of Behavioural Science and Health, University College London, London, United Kingdom

ABSTRACT

Background: Healthcare workers (HCWs) are trusted advisors in vaccination promotion, yet little is known about which strategies they consider most effective. This study evaluated Italian HCWs' preferences for vaccination promotion strategies across different professions and age groups.

Methods: A cross-sectional survey was conducted among 3,000 HCWs (physicians, nurses, pharmacists, and midwives) in Italy between August and September 2025 using computer-assisted telephone interviews. Stratified quota sampling ensured representativeness by region, profession, and gender. Participants rated nine vaccination promotion strategies on a 10-point scale. Descriptive statistics and ANOVA were used to compare mean endorsement scores and endorsement rates (≥6/10) across professional categories and age groups.

Results: All strategies received moderate to strong endorsement (mean scores 5.2-6.6). The two priority strategies were free pre-vaccination laboratory tests and paid time off for vaccination (6.6). Economic incentives (5.2) and improved scheduling access (5.3) received the lowest support. No significant differences emerged across professional categories or age groups, indicating remarkable consensus among HCWs.

Discussion: Italian HCWs prioritize strategies addressing structural and psychological barriers over financial incentives. This consensus suggests policy makers should focus on competence-building, accessibility, and trust-enhancing interventions rather than economic approaches to improve vaccination coverage.

Key words: vaccine, vaccination, healthcare workers, public health, Italy

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Correspondence: Rita Cuciniello, MD / School of Medicine, Vita-Salute San Raffaele University Via Olgettina 58. 20132, Milan, Italy, / Email: cuciniello.rita@hsr.it
ORCID: 0009-0001-4899-3705

Background

Vaccination is a cornerstone of public health for preventing infectious diseases (1). The COVID-19 pandemic underscored the value of vaccines and highlighted challenges such as the spread of misinformation and persistent hesitancy (2). Healthcare workers (HCWs) serve as trusted advisors who shape public attitudes toward immunization, making their perspectives essential for achieving optimal vaccination coverage (3,4). Research has consistently demonstrated that HCWs recommendations significantly influence patient vaccine acceptance (5–7). However, vaccine hesitancy persists among European HCWs, with substantial variation by country, profession, and vaccine type. A systematic review of 55,612 HCWs from 15 European countries found physicians exhibited higher vaccination coverage (79%) compared to nurses (62%), highlighting interprofessional disparities (8). General practitioners' recommendations are influenced by their confidence in vaccine safety, trust in health authorities, and experiences with controversies (9). In Italy, mandatory childhood immunization coverage exceeds 94%, but adherence for non-mandatory vaccinations remains lower (10–14). Geographic and demographic disparities are particularly evident for the human papillomavirus (HPV) vaccine, with coverage among the 2012 birth cohort reaching 66.3% for females but only 58.7% for males as of December 31, 2024 (10). To address these gaps, Italy has implemented multifaceted strategies encompassing policy frameworks, access expansion, and communication initiatives. These include the integration of vaccination objectives within the National Immunization Plan (13), the expansion of mandatory childhood vaccinations in 2017 (15), and targeted seasonal campaigns for high-risk groups, including older adults, pregnant women, people with disability and HCWs (16,17). Evidence suggests that combining education, improved accessibility, and organizational policies can effectively increase vaccine uptake (18–21). While research has documented vaccination promotion strategy effectiveness in controlled settings, a critical gap exists in understanding which approaches are preferred by HCWs. Most studies have evaluated interventions from epidemiological or economic perspectives, measuring outcomes such as coverage rates, cost-effectiveness, and population-level impact (18,22). However, the acceptability and perceived utility of these strategies from the frontline provider perspective, those who ultimately implement vaccination policies and counsel patients, remain largely unexplored. This knowledge gap has significant practical implications. Healthcare workers serve as the primary interface between vaccination policies and public uptake, yet their preferences and perceived implementation barriers are rarely considered in strategy development. Without understanding which approaches HCWs view as feasible and effective, policymakers risk implementing interventions that face professional resistance, potentially undermining real-world effectiveness. Furthermore, existing literature provides limited insight into whether vaccination promotion preferences vary across different healthcare professions or generational cohorts within the HCW (8,23–26). This study addresses these critical knowledge gaps by systematically evaluating Italian HCWs preferences for evidence-based vaccination promotion strategies. By capturing the perspectives of physicians, nurses, pharmacists, and midwives, this research provides essential evidence for developing vaccination policies that align with the preferences of frontline implementers, potentially improving both policy acceptance and real-world effectiveness.

Methods

Study design and population

This cross-sectional survey-based investigation was conducted between August and September 2025, utilizing the computer-assisted telephone interview (CATI) methodology. This method was selected to ensure a broad geographic reach and higher response rates than online surveys, with real-time interviewer support reducing non-response. An independent third-party company administered the questionnaire. The survey population consisted of HCWs, specifically physicians, nurses, pharmacists, and midwives. Physicians were further stratified into general practitioners, pediatricians, and medical specialists to capture perspectives across diverse care settings. A stratified quota

sampling framework was employed to ensure that the sample accurately reflected the heterogeneity of Italian HCWs. Stratification was based on three principal criteria: geographic distribution, as delineated by the five NUTS1 macro-areas defined by the Italian National Institute of Statistics (ISTAT), professional category and gender balance. To achieve the targeted sample size, a total of 4,441 individuals were contacted, of whom 3,000 completed the interview, yielding an overall response rate of approximately 68%.

Questionnaire

The survey instrument consisted of a structured questionnaire designed to assess HCWs' views on effective vaccination coverage strategies. The questionnaire, developed ad hoc on the basis of guidelines and existing literature, was refined through a focus group with 10 HCWs to evaluate its clarity and relevance. The observations collected were subsequently integrated into the final version of the survey instrument. No formal pretest or psychometric validation was conducted. The instrument was organized into 24 sections, aggregated into 6 thematic domains, and incorporated both factual items and measures assessing attitudes and behaviors. The present study focuses specifically on respondents' evaluations of vaccination promotion strategies. The initial section examined sociodemographic and professional traits like age, gender, location, and healthcare role. Following this, it assessed knowledge of vaccination policies, familiarity with the National Immunization Plan, awareness of vaccine availability, and prior training in vaccinology. These elements provided crucial context for evaluating healthcare workers' readiness to advocate for immunization. A central component of the questionnaire investigated attitudes and beliefs regarding vaccines, encompassing perceptions of efficacy and safety, trust in novel technologies, and opinions concerning mandatory vaccination. These attitudinal items were complemented by questions on practical behaviors, such as the frequency with which HCWs recommend vaccines to patients, colleagues, or family members, and the strategies employed when addressing vaccine hesitancy. Another domain addressed informational needs and resource requirements, prompting participants to specify which types of training, materials, or institutional support would most effectively enable them to fulfill their role as trusted advisors in vaccination-related decision-making. The final section evaluated nine discrete vaccination coverage strategies using a 10-point Likert scale (1 = strongly disagree, 10 = strongly agree): economic incentives; paid time off for vaccination; vaccination requirements for specific categories; free pre-vaccination laboratory tests; improved service accessibility; enhanced HCW training in vaccinology; scientific preparation of vaccination staff; workplace vaccination programs; and real-time expert support. An open-ended item captured additional suggestions for strategies. This design enabled the collection of both quantitative data and qualitative insights into HCWs' priorities for enhancing vaccination coverage.

Statistical analysis

Descriptive statistics were computed to characterize the sample and summarize responses to the vaccination strategy items. Continuous variables were reported as means (M) and standard deviations (SD), while categorical variables were expressed as frequencies and percentages. For the vaccination strategy items, we calculated both mean endorsement scores and the proportion of respondents endorsing each strategy (defined as scores ≥6 on the 10-point scale), reflecting a threshold of moderate to strong endorsement. To evaluate differences in strategy preferences across healthcare professional categories, we conducted a one-way ANOVA for nine strategies among four groups: physicians, nurses, pharmacists, and midwives. Effect sizes were calculated using eta-squared (η^2), with values of <0.01 (small), 0.01-0.06 (medium), and >0.06 (large). We also explored generational differences using similar ANOVA models with age as a categorical predictor in five quintile-based categories. Statistical significance was set at $\alpha = 0.05$. Data management and statistical analyses were performed using R version 4.5.1, employing the packages dplyr, tidyr, and ggplot2 for data manipulation and visualization, and base R functions for inferential statistics. Results are presented in accordance with the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines.

Ethical considerations

This study followed the Declaration of Helsinki and Italian privacy laws (Legislative Decree 196/2003 and EU GDPR 2016/679). Due to its non-interventional nature, involving only healthcare professionals and anonymized responses, formal ethical approval was not required. All participants provided verbal consent before the interview, with clear disclosure of study aims, voluntary participation, and the right to withdraw. No personal identifiers were collected or retained, and data were handled in compliance with Italian privacy regulations for scientific purposes.

Results

Sample characteristics

Table 1 summarizes the main demographic characteristics. The sample comprised physicians (n=1,500, 50.0%), nurses (n=800, 26.7%), pharmacists (n=500, 16.7%), and midwives (n=200, 6.7%). The respondents' mean age was 49.9 years (SD=10.6), with 49.9% being 54 years or older. Female participants constituted 65.2% of the sample (n=1,955), consistent with gender distribution in the professions surveyed. Geographic distribution aligned with national population patterns, with representation from all five macroareas: North-West (25.4%), Centre (21.6%), South (23.2%), North-East (19.3%), and Islands (10.6%).

Overall ranking of vaccination strategies

All nine strategies received moderate to strong endorsement, with mean scores ranging from 5.2 to 6.6 on a 10-point scale. Figure 1 highlights that free pre-vaccination laboratory tests and paid time off for vaccination each achieved the highest mean endorsement (Mean [M] 6.6, SD 2.5). Economic incentives (M 5.2, SD 2.5) and improved service accessibility with flexible scheduling (M 5.3, SD 2.5) were the least preferred strategies. Enhanced HCW training in vaccinology, vaccination requirements for specific occupational or risk groups, scientific preparation of vaccination staff, workplace vaccination programs administered by occupational physicians, and real-time expert support all fell in the midrange (M 6.5, SD 2.5), indicating consistent, moderate support across these varied approaches.

Endorsement rates by strategy are presented in Table S1 (Supplementary Material). Free pre-vaccination laboratory tests and paid time off for vaccination were endorsed by 64.9% and 64.1% of respondents (score ≥ 6), respectively. In contrast, economic incentives and improved service accessibility with flexible scheduling were supported by only 47.0% and 48.7% of the respondents, respectively. The remaining strategies showed intermediate endorsement, ranging from 62.3% to 63.9%, underscoring a clear preference for structural and educational interventions over purely financial or logistical measures.

Table 1. Demographic and Professional characteristics of the sample

N. Interviewer	3,000
Age [Mean (SD)]	49.9 (10.6)
Age categories	
≤32 years	249 (8.3%)
33-39 years	352 (11.7%)
40-46 years	387 (12.9%)
47-53 years	514 (17.1%)
≥54 years	1,498 (49.9%)
Gender	
Male	1,045 (34.8%)
Female	1,955 (65.2%)
Profession	
Doctor	1,500 (50.0%)
Nurse	800 (26.7%)
Pharmacist	500 (16.7%)
Midwife	200 (6.7%)
Birth nation	
Italy	2,978 (99.3%)
Foreign	22 (0.7%)
Work macroregion	
North West	761 (25.4%)
North East	580 (19.3%)
Centre	647 (21.6%)
South	695 (23.2%)
Islands	317 (10.6%)

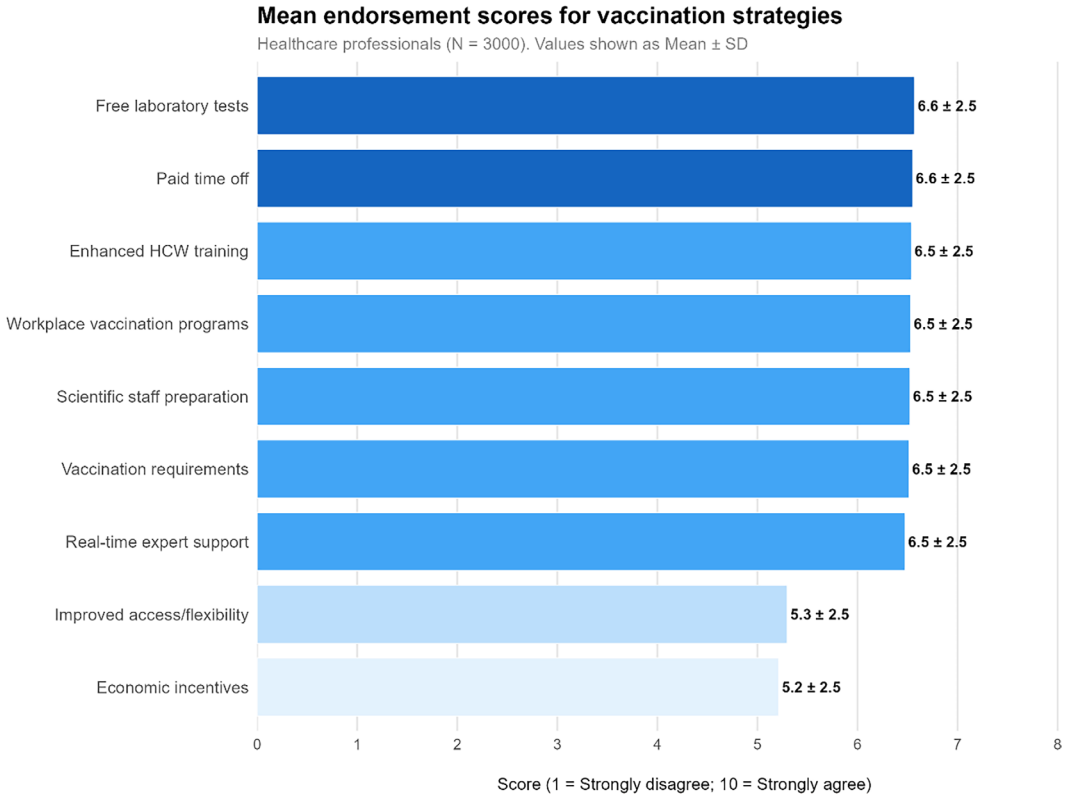

Figure 1. Ranking of mean endorsement scores (Mean ± SD) for nine vaccination promotion strategies among Italian healthcare workers (n = 3,000).

Differences by professional category

Strategy preferences demonstrated remarkable consistency across professional groups, as presented in Table 2. Mean endorsement scores varied minimally among physicians, nurses, pharmacists, and midwives for all nine interventions, with differences generally limited to 0.1-0.3 points on the 10-point scale. This interprofessional consensus was particularly evident for the top-ranked strategies: free laboratory tests received mean scores ranging from 6.4 (pharmacists) to 6.7 (midwives), while paid time off and enhanced training garnered virtually identical evaluations across all groups.

As detailed in Table S2, one-way ANOVA confirmed the absence of statistically significant differences by profession across all strategies (all $p>0.05$). Effect sizes were uniformly small ($\eta^2<0.002$), indicating that professional category accounted for less than 0.2% of variance in strategy preferences. The largest F-statistic was observed for improved access and flexible scheduling ($F(3, 2996) = 1.527$, $p = 0.206$, $\eta^2 = 0.0015$), but even this approached the null hypothesis of no difference. Endorsement rates (proportion scoring ≥6) similarly demonstrated interprofessional concordance, as shown in Table S1. For the top-ranked strategy of free laboratory tests, endorsement ranged narrowly from 63.2% (pharmacists) to 67.5% (midwives), while for economic incentives, the range was 43.9% (nurses) to 48.4% (physicians). These findings suggest that vaccination promotion strategies are evaluated through a shared professional lens, transcending discipline-specific perspectives.

Differences by age group

Age-related patterns in strategy preferences were equally minimal. As presented in Table S3, when

Table 2. Mean endorsement scores (SD) for vaccination strategies by professional category

Rank	Strategy	Total Mean (SD)	Doctor Mean (SD)	Nurse Mean (SD)	Pharmacist Mean (SD)	Midwife Mean (SD)
1	Paid time off for vaccination	6.6 (2.5)	6.6 (2.5)	6.5 (2.5)	6.5 (2.5)	6.4 (2.0)
2	Free laboratory tests	6.6 (2.5)	6.6 (2.6)	6.5 (2.6)	6.4 (2.4)	6.7 (2.2)
3	Vaccination requirements for specific categories	6.5 (2.5)	6.5 (2.5)	6.5 (2.6)	6.5 (2.4)	6.6 (2.0)
4	Enhanced healthcare worker training	6.5 (2.5)	6.5 (2.6)	6.5 (2.6)	6.6 (2.5)	6.6 (2.1)
5	Scientific preparation of vaccination staff	6.5 (2.5)	6.5 (2.6)	6.5 (2.6)	6.7 (2.4)	6.6 (2.1)
6	Workplace vaccination programs	6.5 (2.5)	6.6 (2.6)	6.6 (2.5)	6.5 (2.5)	6.4 (2.2)
7	Real-time expert support	6.5 (2.5)	6.4 (2.6)	6.5 (2.6)	6.4 (2.4)	6.6 (2.1)
8	Improved access and flexible scheduling	5.3 (2.5)	5.4 (2.6)	5.2 (2.5)	5.3 (2.3)	5.3 (1.6)
9	Economic incentives	5.2 (2.5)	5.3 (2.7)	5.1 (2.5)	5.2 (2.3)	5.2 (1.6)

Score: 1=Strongly disagree; 10=Strongly agree.

respondents were stratified into five age categories (≤32, 33-39, 40-46, 47-53, ≥54 years), mean endorsement scores remained stable across generations for all nine strategies. For instance, free laboratory tests received mean scores of 6.4 to 6.6 across all age groups, while paid time off ranged from 6.4 to 6.8. Younger HCWs (≤32 years) exhibited slightly lower endorsement of improved access and flexibility (M=5.0, SD=2.3) compared to older colleagues (M=5.4, SD=2.6 for ≥54 years), but this difference was not statistically significant. As shown in Table S4, endorsement rates by age category reinforced this pattern of generational consensus. For free laboratory tests, endorsement ranged from 62.3% (40-46 years) to 67.3% (33-39 years), while for economic incentives, the range was 45.7% (≥54 years) to 49.6% (40-46 years). The youngest cohort (≤32 years) showed modestly lower endorsement of improved access (41.4%) than other groups (48.9%-49.9%), but this difference did not reach statistical significance. Table S5 shows that ANOVA models comparing age groups yielded uniformly non-significant results across all strategies (all $p > 0.20$). Effect sizes were negligible ($\eta^2 \leq 0.002$), with the largest observed for improved access and flexible scheduling ($F(4, 2995) = 1.486$, $p=0.204$, $\eta^2=0.002$) and paid time off ($F(4, 2995) = 1.453$, $p=0.214$, $\eta^2=0.0019$). These findings suggest that generational differences in vaccination experiences and training have not led to divergent views on optimal promotion strategies.

Qualitative insights from open-ended responses

The open-ended question received 22 responses (0.7% of participants). Although too few for quantitative analysis, these suggestions highlighted recurring themes, including community outreach, school-based education, the use of trusted non-healthcare figures, pharmacy initiatives, and mobile services, indicating interest in approaches that broaden access beyond traditional settings.

Interprofessional and intergenerational consensus

Strategy preferences were notably consistent across professional categories and age groups, with no significant differences (all $p>0.05$, all $\eta^2<0.002$). The top two strategies were similarly endorsed across all demographic subgroups, while economic incentives and improved access received consistently lower ratings. This suggests a unified perspective on vaccination promotion among Italian healthcare professionals.

Discussion

This national survey of 3,000 Italian healthcare workers reveals a striking interprofessional and intergenerational consensus regarding strategies to enhance vaccination coverage in the general population. The

convergence of preferences across physicians, nurses, pharmacists, and midwives, as well as across diverse age cohorts, represents a notable departure from the professional and generational divides often observed in healthcare attitudes toward vaccination. Our findings carry important implications for policy design, suggesting that strategies prioritized by HCWs transcend traditional professional silos and reflect shared values rooted in healthcare delivery principles.

Interpretation of findings

The two top-ranked interventions, free pre-vaccination laboratory tests and paid time off for vaccination, share a common goal of removing practical and psychological barriers to immunization. Although routine lab screening is not clinically essential for most vaccines, offering it can alleviate safety concerns and provide reassurance, functioning as a low-stakes, confidence-building measure (27–29). This finding aligns with principles of behavioral economics, suggesting that reducing perceived barriers, even those not grounded in clinical necessity, can meaningfully influence health-seeking behaviors (30). Similarly, strong support for paid time off underscores HCWs' recognition that logistical constraints represent a genuine impediment to vaccination uptake, particularly for working-age adults with inflexible schedules. International evidence supports this perspective: paid sick leave policies have been associated with higher vaccination rates, as they mitigate the economic opportunity costs of seeking preventive care (31). The endorsement of this strategy suggests that Italian HCWs view vaccination as a shared societal responsibility requiring systemic accommodations, rather than solely an individual obligation. However, the efficacy of these evidence-based framings may be undermined by the spread of fake news and social media misinformation; understanding how HCWs respond to disinformation is essential to adapt and reinforce these strategies (32). Strategies aimed at strengthening professional capacity, including enhanced vaccinology training, vaccination requirements for specific occupational or risk groups, scientific preparation of vaccination staff, workplace vaccination programs administered by occupational physicians, and real-time expert support for vaccination queries, garnered uniform, moderate support. This pattern underscores widespread recognition of gaps in HCW training and the perceived value of hands-on guidance and peer support to bolster confidence and recommendation practices (3,8,18,33). On the other hand, economic incentives for vaccination and improved service accessibility with flexible scheduling were the least endorsed. The reluctance toward financial incentives may reflect professional norms that prioritize intrinsic motivations and ethical concerns about commodifying public health (22,34). Low enthusiasm for broad "access improvements" may stem from the perception that existing service networks, such as pharmacies, primary care, and community clinics, already offer sufficient flexibility or from the vague wording of the item, which may have hindered clear evaluation (35,36). Differently from prior literature reporting differences in vaccine attitudes by profession and age (8,37), our analyses revealed no significant variation among physicians, nurses, pharmacists, and midwives or across five age cohorts (ANOVA $p>0.05$; $\eta^2<0.002$; Supplementary Tables S2–S5). This striking consensus may reflect the survey's population-level framing, which activated shared professional identities and public health values, as well as the unifying influence of the COVID-19 pandemic and Italy's cohesive immunization policies (2,11,13,38,39). Although only 22 respondents (0.7%) provided open-ended feedback, their suggestions, including school-linked vaccination programs, pharmacy-based initiatives, mobile units, and engagement of trusted community figures, highlight the potential of decentralized, culturally embedded strategies to reach underserved populations (35,40–42). These community-driven concepts warrant formal evaluation in future studies.

Policy implications

Our results suggest several concrete actions for policymakers. First, allocating resources to provide free or subsidized pre-vaccination laboratory assessments (27–29), even when not strictly necessary from a clinical standpoint, can serve as a simple yet powerful means of reducing anxiety and psychological barriers among hesitant individuals. Offering reassurance through such assessments may increase confidence in

vaccine safety and foster greater uptake. Second, enacting legislation or workplace regulations that guarantee paid time off for vaccination appointments would directly address the scheduling and financial constraints faced by working-age adults (31). By removing opportunity costs, this measure can facilitate access and signal that vaccination is a shared societal responsibility rather than an individual burden. Third, investing in comprehensive, interprofessional vaccinology training for all healthcare worker groups will not only enhance knowledge but also empower providers to address patient concerns confidently (3,8,18,32). Well-designed continuing education programs can enhance HCWs' role as trusted advocates and improve the quality of vaccine counseling. At the same time, caution is warranted before introducing economic incentive schemes (22,33). Our findings indicate marked skepticism among HCWs toward financial rewards for vaccination, likely rooted in professional norms that prioritize intrinsic motivation and ethical considerations. Should policymakers choose to pilot incentive programs (43,44), they must partner with healthcare workers in program design, communicate transparently about the evidence and ethical rationale, and monitor for unintended consequences. By aligning policy measures with HCWs values and professional expertise, vaccination strategies will be more credible, acceptable, and ultimately effective.

Strengths and Limitations

This study's strengths include its large, nationally representative sample, stratified by profession and geography, and its use of standardized quantitative measures complemented by qualitative insights. The high response rate (68%) is a strength; however, possible recruitment and selection bias cannot be ruled out. Several limitations also warrant acknowledgment. First, this analysis focused on HCWs' strategy preferences for the general population, omitting personal vaccination behaviors and hesitancy determinants; future work will leverage the full dataset to examine these aspects. Second, the cross-sectional design precludes causal inference or assessment of temporal changes in attitudes. Longitudinal research would be valuable to determine whether the observed consensus persists over time or shifts in response to new vaccines, policy changes, or public health crises. Third, while the nine strategies evaluated represent established approaches documented in the vaccination policy and implementation literature, future research could examine emerging interventions, such as digital health tools, social media campaigns, or behavioral nudges, to provide a more comprehensive mapping of the strategic landscape. Fourth, social desirability bias may have influenced responses, particularly on politically sensitive topics such as economic incentives or mandatory vaccination. The telephone interview format, while enabling high response rates, may have amplified such effects compared to anonymous online surveys (45). Fifth, the questionnaire was not formally validated, so its reliability and psychometric properties remain unverified. Sixth, the sample did not include medical residents, who represent an increasingly relevant segment of the healthcare workforce with potentially distinct attitudes and priorities regarding vaccination strategies (46,47). Their exclusion may limit the generalizability of findings to the youngest cohorts of healthcare professionals. Seventh, the study was conducted in Italy, and its findings may not be generalizable to countries with different healthcare systems, vaccination policies, or cultural attitudes toward public health interventions. Finally, while no significant professional or generational differences emerged, more detailed subgroup analyses by specialty, practice setting or urban versus rural location may uncover additional heterogeneity.

Future directions

Several avenues for future research emerge from this work. First, experimental or quasi-experimental studies are needed to directly test the effectiveness of the most endorsed strategies (free laboratory tests, paid leave, HCW training) in real-world settings. Second, qualitative research should explore the reasoning behind HCWs' skepticism toward economic incentives and low prioritization of access improvements, providing depth to complement our quantitative findings. Third, studies should assess whether the consensus observed here persists across different vaccines (e.g., childhood vs. adult, mandatory vs.

recommended) or epidemic contexts. Fourth, comparative research across European countries would illuminate the extent to which Italian HCWs' preferences reflect broader continental trends or nation-specific factors. Finally, patient-centered research examining whether strategies endorsed by HCWs align with patient preferences would provide crucial triangulation for policy design.

Conclusions

Italian healthcare workers largely agree on vaccination promotion strategies, emphasizing the need to remove barriers, improve access, and enhance professional competence, while being skeptical of economic incentives. This consensus suggests that policies reflecting these priorities will be widely accepted by the healthcare workforce, improving their effectiveness. As Italy and other countries aim to boost vaccination coverage post-pandemic, these findings support policy decisions that resonate with frontline workers, whose engagement is crucial for effective implementation.

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Appendix

Table S1. Endorsement rates (score ≥6/10) for each vaccination strategy by professional category

Rank	Strategy	Total Mean (SD)	Doctor Mean (SD)	Nurse Mean (SD)	Pharmacist Mean (SD)	Midwife Mean (SD)
1	Free laboratory tests	64.9%	65.7%	63.7%	63.2%	67.5%
2	Workplace vaccination programs	64.1%	64.7%	65.1%	61.2%	62.0%
3	Vaccination requirements for specific categories	63.9%	63.4%	63.4%	65.2%	66.0%
4	Enhanced healthcare worker training	63.8%	63.5%	61.9%	66.6%	67.5%
5	Scientific preparation of vaccination staff	63.8%	62.7%	62.5%	68.2%	66.0%
6	Paid time off for vaccination	63.5%	64.4%	62.7%	62.0%	64.0%
7	Real-time expert support	62.3%	61.0%	62.9%	63.2%	67.5%
8	Improved access and flexible scheduling	48.7%	50.5%	45.4%	48.0%	50.0%
9	Economic incentives	47.0%	48.4%	43.9%	47.4%	47.5%

Score: 1=Strongly disagree; 10=Strongly agree.

Table S2. One-way ANOVA results for endorsement scores by profession category for each strategy

Strategy	F_statistic	df1	df2	p_value	η^2	Significant
Improved access and flexible scheduling	1.527	3	2996	0.2055	0.0015	ns
Economic incentives	1.291	3	2996	0.2758	0.0013	ns
Paid time off for vaccination	1.239	3	2996	0.2938	0.0012	ns
Free laboratory tests	0.825	3	2996	0.4802	0.0008	ns
Scientific preparation of vaccination staff	0.674	3	2996	0.5682	0.0007	ns
Workplace vaccination programs	0.568	3	2996	0.6363	0.0006	ns
Real-time expert support	0.478	3	2996	0.6978	0.0005	ns
Enhanced healthcare worker training	0.437	3	2996	0.7266	0.0004	ns
Vaccination requirements for specific categories	0.033	3	2996	0.9918	0.0000	ns

η^2 = eta squared (effect size); ns = not significant ($p > 0.05$).

Table S3. Mean endorsement scores (SD) for vaccination strategies by age category

Rank	Strategy	Total Mean (SD)	≤32 Mean (SD)	33-39 Mean (SD)	40-46 Mean (SD)	47-53 Mean (SD)	≥54 Mean (SD)
1	Paid time off for vaccination	6.6 (2.5)	6.5 (2.3)	6.4 (2.3)	6.8 (2.4)	6.5 (2.5)	6.6 (2.6)
2	Free laboratory tests	6.6 (2.5)	6.5 (2.5)	6.6 (2.4)	6.4 (2.4)	6.6 (2.5)	6.6 (2.6)
3	Vaccination requirements for specific categories	6.5 (2.5)	6.7 (2.5)	6.5 (2.3)	6.5 (2.4)	6.5 (2.4)	6.5 (2.6)
4	Enhanced healthcare worker training	6.5 (2.5)	6.8 (2.5)	6.5 (2.3)	6.4 (2.4)	6.5 (2.5)	6.6 (2.6)

Rank	Strategy	Total Mean (SD)	≤32 Mean (SD)	33-39 Mean (SD)	40-46 Mean (SD	47-53 Mean (SD)	≥54 Mean (SD)
5	Scientific preparation of vaccination staff	6.5 (2.5)	6.5 (2.5)	6.4 (2.4)	6.5 (2.3)	6.6 (2.5)	6.6 (2.6)
6	Workplace vaccination programs	6.5 (2.5)	6.5 (2.4)	6.4 (2.4)	6.5 (2.4)	6.6 (2.5)	6.6 (2.6)
7	Real-time expert support	6.5 (2.5)	6.6 (2.4)	6.7 (2.3)	6.4 (2.4)	6.5 (2.5)	6.4 (2.6)
8	Improved access and flexible scheduling	5.3 (2.5)	5.0 (2.3)	5.2 (2.2)	5.2 (2.3)	5.4 (2.4)	5.4 (2.6)
9	Economic incentives	5.2 (2.5)	5.2 (2.2)	5.2 (2.3)	5.3 (2.3)	5.3 (2.5)	5.1 (2.6)

Score: 1=Strongly disagree; 10=Strongly agree.

Table S4. Endorsement rates (score ≥6/10) for each vaccination strategy by age category

Rank	Strategy	Total Mean (SD)	≤32 Mean (SD)	33-39 Mean (SD)	40-46 Mean (SD)	47-53 Mean (SD)	≥54 Mean (SD)
1	Free laboratory tests	64.9%	65.9%	67.3%	62.3%	65.8%	64.6%
2	Workplace vaccination programs	64.1%	64.7%	64.2%	65.9%	64.8%	63.2%
3	Vaccination requirements for specific categories	63.9%	66.7%	64.8%	66.7%	63.0%	62.8%
4	Enhanced healthcare worker training	63.8%	66.7%	67.0%	63.3%	64.0%	62.7%
5	Scientific preparation of vaccination staff	63.8%	64.7%	63.6%	65.1%	67.3%	62.1%
6	Paid time off for vaccination	63.5%	65.1%	63.4%	68.2%	62.6%	62.4%
7	Real-time expert support	62.3%	65.9%	67.9%	63.3%	62.6%	60.0%
8	Improved access and flexible scheduling	48.7%	41.4%	48.9%	49.9%	49.2%	49.4%
9	Economic incentives	47.0%	47.8%	49.1%	49.6%	46.9%	45.7%

Score: 1=Strongly disagree; 10=Strongly agree.

Table S5. One-way ANOVA results for endorsement scores by age category for each strategy

Strategy	F_statistic	df1	df2	p_value	η^2	Significant
Improved access and flexible scheduling	1.486	4	2995	0.2036	0.002	ns
Economic incentives	1.453	4	2995	0.2139	0.0019	ns
Paid time off for vaccination	1.015	4	2995	0.3981	0.0014	ns
Free laboratory tests	0.933	4	2995	0.4438	0.0012	ns
Scientific preparation of vaccination staff	0.908	4	2995	0.4580	0.0012	ns
Workplace vaccination programs	0.887	4	2995	0.4708	0.0012	ns
Real-time expert support	0.548	4	2995	0.7006	0.0007	ns
Enhanced healthcare worker training	0.463	4	2995	0.7627	0.0006	ns
Vaccination requirements for specific categories	0.387	4	2995	0.8184	0.0005	ns

η^2 = eta squared (effect size); ns = not significant ($p > 0.05$).