



Compulsory service program for healthcare workers: a qualitative driver analysis from ophthalmologists' perspectives

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ABSTRACT

Background: Compulsory service programs are used to improve access to health professionals in underserved areas. Their implementation depends on workforce conditions, organizational support, and the wider policy environment. Specialist services such as ophthalmology likewise rely on functioning clinical infrastructure, trained support staff, and referral capacity. This study aimed to identify the main factors and driving forces shaping the future of Iran's compulsory service program for healthcare workers in underserved areas, drawing on ophthalmologists' experiences and an expert-panel assessment.

Methods: A qualitative driver-analysis study was conducted. Environmental scanning drew on articles, books, media sources, and expert interviews. Eighteen ophthalmologists were interviewed using purposive sampling, with recruitment continuing until code saturation was reached. Interview data were analyzed using conventional qualitative content analysis, and the identified factors were subsequently organized using the PESTEL framework: political, economic, sociocultural, technological, environmental, and legal factors. A five-member expert panel identified the final driving forces qualitatively through discussion.

Results: Eighteen ophthalmologists participated in the interviews: 13 (72.2%) were men, median age was 37.5 years (IQR, 35.0–42.8; range, 30–63), and 12 (66.7%) had personally worked in an underserved area. Responses on the principal challenge were categorized as financial for 10 participants (55.6%), management or implementation for seven (38.9%), and sociocultural for one (5.6%); 17 participants (94.4%) considered the program in need of redesign, and 13 (72.2%) stated they would be willing to serve in an underserved area if major problems were corrected. The expert panel identified 10 driving forces: national infrastructure development; welfare and financial support for the health workforce; international sanctions; service-recipient satisfaction; willingness of policymakers, legislators, and implementers to continue the program; political and social stability and security; social demand for free medical services; epidemics and emerging diseases; physicians' social satisfaction; and the national health profile, including population and disease patterns.

Conclusions: In this purposively selected ophthalmologist sample, financial and management or implementation problems were the most frequently categorized immediate challenges. The expert panel identified 10 driving forces spanning workforce conditions and broader political, social, and health-system factors. These driving forces should be regarded as expert-identified areas for policy review and future evaluation rather than as established causal determinants.

KEYWORDS

compulsory service, health workforce, ophthalmology, underserved areas, qualitative research, driver analysis

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INTRODUCTION

Geographical maldistribution of health professionals limits access to care in many health systems [1, 2]. Compulsory service is one response, requiring clinicians to work for a defined period in rural or underserved areas [1, 3]. Such programs differ in who is covered, how placements are assigned, length of service, incentives, enforcement, and links with education or professional registration [1, 3]. The performance of such programs also depends on the political, economic, organizational, and local conditions under which they operate [2, 4].

In Iran, compulsory service has been used as a health-workforce policy, including service requirements affecting medical graduates and specialist physicians [5–7], who upon completing training may be required to serve in public facilities for a specified period following graduation [7].

A national study described mandatory service for ophthalmologists in underserved areas, documenting marked geographical variation in the distribution of ophthalmologists and optometrists despite adequate national numbers [8]. A population-based survey in deprived villages of two Iranian provinces reported a substantial burden of visual impairment, largely from uncorrected refractive error and cataracts, where access to eye care is limited [9]. Iranian discrete choice experiments among medical students and neurosurgeons have identified salary, welfare amenities or housing, clinical infrastructure, workload, educational opportunities, permission for dual practice, contract duration, and work location as relevant to job preferences [5, 10, 11]. A qualitative study of general practitioners identified challenges in medical education (student selection, students' perceptions of their field, educational setting, and curriculum) as limiting rural retention [12]. An opinion piece co-authored by two of the present authors on trainee physicians in Iran during the COVID-19 pandemic described low remuneration, inadequate insurance and social support, and wider health-system pressures [13]. Studies from Australia report related workforce pressures among rural specialists and the rural eye-care workforce, including heavy on-call workloads and burnout, limited funding for outreach services and doubts about financial sustainability, and workforce shortage and distribution problems [14–16].

The aim of this study was to identify the main factors and driving forces shaping the future of Iran's compulsory service program for healthcare workers in underserved areas, drawing on ophthalmologists' experiences and an expert-panel assessment.

METHODS

Study design and setting

This qualitative driver-analysis study was designed to identify influential factors and driving forces related to the compulsory service program. The 24-month study was conducted in Tehran, Iran, between October 2021 and October 2023. At the time of the study, participants were working in several cities—Tehran, Rasht, Ahvaz, Qazvin, Dezful, Mahshahr, Shiraz, and Bukan—providing geographical and professional variation within the study sample.

The study received institutional and departmental approval. Informed consent was obtained before participation. Participants were informed that interviews would be recorded, that their information would be treated confidentially, and that findings would be reported anonymously. Potentially identifying contextual details were generalized or omitted from reported quotations and participant descriptions where necessary to protect confidentiality. Illustrative quotations used in the manuscript were translated from Persian into English and kept as close as possible to their original meaning.

The overall analytic sequence comprised environmental scanning, interviews, qualitative content analysis, organization of the identified factors using the PESTEL framework, and expert assessment of the factors, followed by identification of the final driving forces.

Environmental scanning

Environmental scanning constituted the first stage of the study. Information relevant to the compulsory service program and its future context was gathered from articles, media sources, books, and other relevant Persian- and English-language materials, together with information obtained through expert interviews. Factors identified across these sources were brought together for subsequent analysis. Environmental scanning and PESTEL-based assessment have previously been used to identify influential macro-environmental factors in Iranian health-system research [17].

Participant selection and sampling

Participants were eligible if they were familiar with the compulsory service program through practical or academic experience, agreed to participate, and were able to provide relevant experience and perspectives. Eighteen ophthalmologists participated in the formal interviews.

Purposive sampling was used to select information-rich participants with knowledge or experience relevant to the study question [18]. This approach is consistent with the purpose of qualitative sampling, in which participants are selected for their capacity to provide detailed information about the phenomenon of interest rather than for statistical representativeness.

No fixed sample size was specified in advance. Recruitment, data collection, and preliminary assessment of the emerging data proceeded iteratively. Saturation was assessed at the level of code saturation: recruitment continued until additional interviews largely repeated previously identified information and did not generate substantive new codes or topics requiring extension of the coding framework. Recruitment was discontinued after 18 formal interviews when this level of redundancy had been reached. This approach was used to assess adequacy of the qualitative sample rather than statistical representativeness [19, 20]. The distinction is important because code saturation concerns identification of the range of relevant issues and stabilization of the coding structure, rather than the more extensive interpretive depth associated with meaning saturation [19].

Interview procedures and data collection

The interviews comprised two components. The first collected demographic and professional characteristics and responses to structured questions relevant to the compulsory service program. These included previous work in an underserved area, whether the program required redesign, the principal challenge associated with the program, an overall assessment of the program's success, and willingness to serve in an underserved area if major problems were corrected. The second component consisted of semi-structured, open-ended questions designed to elicit participants' experiences and perspectives. Participants were also asked about challenges that might influence the future of medical practice over the following 20 years and which of these they considered least predictable. Open-ended discussion was used to elicit additional challenges and future-oriented factors relevant to compulsory service.

Interviews lasted approximately 30–180 minutes. Before each interview, participants were informed that the discussion would be recorded and that the information provided would remain confidential and be reported anonymously. After recording had ended, participants could provide additional information that they did not wish to have recorded. Recorded material was stored confidentially.

The interviews were conducted by an ophthalmologist familiar with the compulsory service program and its implementation in Iran. This professional familiarity facilitated understanding of the context and participants' experiences but also created the possibility that prior knowledge could influence data collection or interpretation. Accordingly, open-ended questions were used, participants were encouraged to introduce issues not anticipated by the interviewer, and divergent views were retained during analysis. Consideration of researcher positionality is particularly relevant in qualitative research because professional experience and familiarity with the phenomenon under investigation can influence the generation and interpretation of data [21].

PESTEL classification

Following qualitative analysis and consolidation, the identified macro-environmental factors were organized using the PESTEL framework: political, economic, sociocultural, technological, environmental, and legal factors [17, 22]. PESTEL provides a structured framework for examining broad environmental influences and subsequently identifying factors likely to be important drivers of change. The framework was used to organize the external environment; because some environmental influences were interconnected, individual factors could reasonably be classified under more than one PESTEL domain.

Expert-panel assessment and identification of driving forces

A separate expert-panel stage was used to assess the factors generated through the preceding stages. The panel comprised five experts, including two ophthalmologists and three policymakers, selected for complementary clinical, policy, management, and health-system expertise. The panel was constituted separately from the interview sample, although some panel members had also participated in the formal interviews.

The factors derived from the environmental scan and interviews and subsequently organized using PESTEL were presented to the panel for assessment in relation to the future of the compulsory service program. Importance-uncertainty assessment has been used in Iranian health-system futures research to prioritize variables potentially relevant to future change [23].

Following this assessment, the panel reviewed and discussed the factors considered most relevant to the future of the program. Related factors were considered together and, where appropriate, synthesized into broader constructs.

Through this expert assessment and discussion, the final set of driving forces was identified. These driving forces were therefore treated as outputs of the expert-panel stage rather than as themes arising directly from the interview data, consistent with the presentation in the Results section.

Data processing and qualitative analysis

Demographic characteristics and responses to the structured interview questions were entered into IBM SPSS Statistics, version 20.0 (IBM Corp., Armonk, NY, USA), and summarized descriptively. Age distribution was assessed using the Shapiro–Wilk test. Because the age distribution was non-normal, age was summarized using the median, interquartile range (IQR), and range. Categorical participant characteristics and structured responses were summarized as frequencies and percentages. No inferential analyses of study outcomes were performed.

Interview data were analyzed using conventional qualitative content analysis [24, 25]. In this approach, initial codes are derived from the data rather than imposed from an a priori theoretical coding scheme. Relevant statements were identified and coded, then grouped into broader factors. Overlapping factors were consolidated while retaining distinct concepts and divergent views. Variation in participants' assessments of the program's success was retained and considered during interpretation. The coding framework was refined iteratively as analysis proceeded.

The analysis therefore comprised two conceptually distinct steps. First, interview material was coded inductively using conventional qualitative content analysis. Second, after the factors had been identified and consolidated they were organized within the PESTEL framework. This sequencing preserved the data-derived nature of the initial qualitative analysis while allowing the resulting factors to be considered within a predefined macro-environmental structure.

Credibility was further supported through iterative review of the data, comparison across information sources, retention of divergent views, and use of illustrative participant quotations. An explicit analytic pathway was maintained from participants' accounts through coding and consolidation to PESTEL classification and subsequent expert-panel assessment. These procedures were considered in accordance with principles of qualitative trustworthiness and transparent qualitative reporting [21, 24, 26]. Graneheim and Lundman emphasize credibility, dependability, and transferability as central considerations in qualitative content analysis, while the Standards for Reporting Qualitative Research (SRQR) recommends explicit reporting of sampling, data collection, processing, analysis, reflexivity, and strategies used to enhance trustworthiness [24, 26].

RESULTS

A total of 18 ophthalmologists participated in the interviews, 13 men (72.2%) and five women (27.8%), with a median age of 37.5 years (IQR, 35.0–42.8; range, 30–63): 11 participants (61.1%) were aged 30–40, five (27.8%) were aged 41–50, and two (11.1%) were older than 50. Twelve participants (66.7%) had personally worked in an underserved area. Nine (50.0%) had fellowship training, consisting of an 18-month post-national-board fellowship program regulated by the Ministry of Health and Medical Education, and five (27.8%) were university faculty members. Thirteen participants (72.2%) were non-faculty specialists, 16 (88.9%) were married, and two (11.1%) had previous health-policy or administrative experience. Thirteen participants (72.2%) had less than 10 years of ophthalmology practice, whereas five (27.8%) had 10 years or more of professional experience. Their demographic and professional characteristics are summarized in Table 1.

When asked to identify the main challenge of compulsory service, the principal challenge was categorized as financial for 10 participants (55.6%), management or implementation for seven (38.9%), and sociocultural for one (5.6%). Seventeen (94.4%) believed that the program required redesign. Thirteen (72.2%) stated they would be willing to serve in an underserved area if the main problems were corrected.

When asked for an overall assessment, 13 participants (72.2%) described the program as unsuccessful, three (16.7%) as partly successful, and two (11.1%) as successful. These figures portray this purposively selected sample and are not population estimates. Participants reported a wide range of challenges. These were consolidated with factors identified during environmental scanning and organized using PESTEL. Several organizational and management-related factors (for example, limited transportation, referral system, staffing shortages, supervision, working hours, and on-call duties) do not map cleanly onto a single PESTEL domain; each was placed in the domain judged closest in meaning, without treating categories as mutually exclusive.

The following accounts illustrate how participants described several of the factors identified in the qualitative analysis, presented in Table 2. The quotations were translated from Persian and are presented as examples of participants' views rather than as estimates of prevalence.

Table 1. Characteristics of the 18 interview participants

Characteristic	Value
Sex (Male / Female), n (%)	13 (72.2) / 5 (27.8)
Age (y)	
Median (IQR; range)	37.5 (35.0–42.8; 30–63)
30–40 years, n (%)	11 (61.1)
41–50 years, n (%)	5 (27.8)
>50 years, n (%)	2 (11.1)
Marital status (Married / Single), n (%)	16 (88.9) / 2 (11.1)
Professional characteristics, n (%)	
Fellowship training*	9 (50.0)
University faculty member (assistant, associate, or full professor)	5 (27.8)
Non-faculty specialist	13 (72.2)
Previous health-policy/administrative experience	2 (11.1)
Previous work in an underserved area	12 (66.7)
No direct work in an underserved area	6 (33.3)
<10 y ophthalmology practice	13 (72.2)
≥10 y ophthalmology practice	5 (27.8)

Abbreviations: n, number of participants; %, percentage; y, years; IQR, interquartile range. Note: * Fellowship training refers to an 18-month post-national-board fellowship program regulated by the Ministry of Health and Medical Education.

Table 2. PESTEL (political, economic, sociocultural, technological, environmental, and legal factors) classification of identified challenges

PESTEL domain	Factors identified from interviews and environmental scanning
Political	Macro-level health and healthcare management; provincial health-management inadequacy; inadequate supervision and control; perceived unfairness and corruption in deployment; conflicts of interest among influential actors and managers; low security in underserved areas; limited transportation; inadequate referral system; insufficiently skilled personnel; insufficient personnel; lack of a skilled supervisor.
Economic	Low salary; delayed performance-related payments; low tariffs; lack of insurer commitment; small loans; insurer delays and deductions in payment; low retention allowance; poor food quality; poor accommodation quality.
Sociocultural	Insufficient public trust in the compulsory-service physician; limited educational and study opportunities; local cultural difficulties; lack of recognition of physicians' value; lack of appreciation for services; occupational stress and low psychological comfort; separation from family; resistance of established physicians to newly deployed physicians; lack of replacement staff; high patient volume.
Technological	Inadequate technology infrastructure in underserved areas; lack of access to scientific books and journals; inadequate electronic-prescribing infrastructure; shortages of operating-room facilities, medicines, and equipment.
Environmental	Problems with access to safe water in some areas.
Legal	Outdated compulsory-service law; perceived unrealistic deprivation coefficients; inadequate health insurance for physicians; restrictions on establishing private practice; lack of employment priority; absence of social insurance; limited leave; long working hours; frequent on-call duties.

One senior participant with substantial professional experience considered continued sanctions and economic crises to be among the major challenges affecting the future of medicine in Iran. He also considered the compulsory deployment program to require substantial revision because basic living conditions and the equipment required to provide services were insufficient in underserved areas. He expressed being willing to serve again in an underserved area if the major challenges were addressed.

A younger participant with previous experience working in an underserved area similarly expressed willingness to serve again if the major challenges were addressed: *"Migration of the health workforce is one of the main challenges affecting the future of medicine in the country, and the warning signs are already apparent. Burnout of the health workforce, shortages of medicines and equipment in underserved areas, and unrealistic tariffs are also serious challenges that may cause harm if they aren't taken seriously."*

Table 3. Driving forces identified by the expert panel

No.	Driving force identified by the expert panel
1	National infrastructure development
2	Welfare and financial support for the health workforce
3	International sanctions
4	Level of service-recipient satisfaction
5	Willingness of policymakers, legislators, and implementers to continue the program
6	Political and social stability and security
7	Social demand for free medical services
8	Epidemics and emerging diseases
9	Level of physicians' social satisfaction
10	National health profile (population and diseases)

Another participant with extensive experience working in an underserved area emphasized limitations in clinical infrastructure and financial incentives: *"Lack of facilities in the operating room and the absence of economic incentives are major challenges. If the current approach continues, medical education may decline, followed by a reduction in the quality of health services."*

One university faculty member considered the program in need of redesign. While acknowledging that the program had been partly successful in addressing clinical workload, he believed quotas and exemptions had allowed some individuals to avoid deployment or provide ineffective service in underserved areas, and emphasized that *"compulsion does not help; the incentives should be attractive enough for a person to decide to serve in an underserved area."* He also identified economic crises, social dissatisfaction, low tariffs, shortages of medicines and medical equipment, health-worker burnout, management shortcomings, and physician migration as foreseeable challenges.

Another faculty member with previous voluntary service in an underserved area described shortcomings in health insurance and welfare arrangements. He saw inadequate insurance coverage and the payment and taxation systems as relevant to physician retention, stating that *"retention of specialist health workers in underserved areas requires other forms of support, particularly the provision of housing."* He also argued that health policies and implementation should be informed by scientific research and consultation with researchers.

Several participants stated that family circumstances could prevent them from returning to an underserved area even if the program were revised. One attributed the perceived lack of success of the program to *"inadequate financial support, family and social circumstances, the compulsory nature of the program, and the lack of facilities required for appropriate scientific work,"* while also referring to management shortcomings and the need for revision.

One participant identified migration of health workers from developing to developed countries as a challenge for the future of Iranian medicine. He also expressed concern about physicians from different specialties entering aesthetic practice, which he considered potentially problematic because of overlap between specialties and the greater financial attractiveness of aesthetic services. He further referred to perceived inconsistencies in the valuation of medical services, using eyelid reconstruction after tumor treatment as an example of a procedure that he considered inadequately remunerated relative to its legal responsibility.

A participant with longstanding experience working in an underserved area argued that incentives should be sufficiently attractive to encourage voluntary service rather than reliance on compulsion and disciplinary mechanisms. He also expressed concern that repeated exemptions and changes in the regulations could allow some individuals to avoid service. He emphasized the need to plan in advance for the skilled health workforce that the country would require over the next 20 years.

Concerns about governance were also expressed. One participant referred to conflicts of interest, transparency, unequal access to opportunities, and areas of the health system that he perceived as vulnerable to inappropriate influence or corruption. He advocated greater transparency, decentralization, attention to reports of possible corruption, and appropriate action when misconduct was established. These statements reflected the participant's perceptions and were not independently verified in this study.

Another participant emphasized delayed remuneration: *“Insurance organizations and universities have delays of 12 to 18 months in paying claims; this means that the performance payment a specialist receives today relates to about a year and a half earlier.”* He also referred to inflation and the decline in the value of delayed payments, arguing for greater financial discipline. In addition, he considered that the Ministry of Health should focus more on policymaking than direct service management, and emphasized the importance of appropriate clinical guidelines, referral systems, and medical education that gives greater consideration to the needs of underserved populations.

After the identified factors had been assessed and reviewed by the expert panel, 10 driving forces were identified. These represent the output of the expert-panel stage rather than themes derived directly from the interviews alone.

Table 2 lists the detailed, program-level issues identified from the interviews and environmental scanning. The resulting 10 driving forces are presented in Table 3. Some driving forces in Table 3 (for example, epidemics and emerging diseases, the national health profile, and social demand for free medical services) reflect broader contextual factors identified through the environmental scan and panel discussion rather than itemized interview issues.

DISCUSSION

Financial issues were the most frequently categorized primary challenge (10 of 18 participants, 55.6%), followed by management or implementation problems (7 of 18, 38.9%). Seventeen (94.4%) participants considered the compulsory service program to require redesign, and 13 (72.2%) stated they would be willing to serve in an underserved area if the major problems were corrected. The qualitative findings spanned all six PESTEL domains. Following qualitative assessment and expert-panel review, 10 driving forces were identified, including national infrastructure development; welfare and financial support for the health workforce; international sanctions; service-recipient satisfaction; policymakers' and implementers' willingness to continue the program; political and social stability and security; social demand for free medical services; epidemics and emerging diseases; physicians' social satisfaction; and the national health profile in terms of population and disease patterns.

This pattern is consistent with earlier work showing that compulsory service and rural workforce policies are shaped by more than one level of influence. Reviews have identified program design, institutional support, benefits, infrastructure, staffing, professional environment, social circumstances, and wider policy context as relevant to recruitment and retention [1–4]. A PESTLE analysis of public hospitals in the same national setting also identified sanctions, changing disease patterns, financing, and governance among important macro-environmental influences [17]. A separate Iranian qualitative futures study of hospitals likewise identified political and legal, economic, demographic and disease, technological, environmental, and health-workforce changes as relevant to the future health-system environment [27].

The interview findings help explain why infrastructure and welfare support emerged as driving forces. Participants described delayed payments, low tariffs, housing and transport problems, limited operating-room facilities, equipment shortages, staffing difficulties, and lack of experienced supervision. Similar factors have been found in studies of work in deprived areas. Among neurosurgeons, salary, permission for dual practice, clinical infrastructure, housing, and educational facilities influenced job preferences [10]. Discrete choice experiments among Iranian medical students [5] and among medicine, dentistry, and pharmacy students [11] likewise found that salary counted as a factor alongside work difficulty and workload, welfare amenities, work location, and contract duration. A qualitative study of general practitioners identified medical-education challenges (student selection, students' perceptions of their field, education setting, and curriculum) as potential barriers to rural retention [12].

An opinion piece on trainee physicians in Iran during the COVID-19 pandemic highlighted low remuneration, inadequate insurance support, and broader health-system pressures [13]. Although that paper does not establish how common these conditions are among ophthalmologists, its relevance is mainly contextual, as similar employment and welfare concerns had been raised elsewhere in the medical workforce.

International evidence also suggests that salary should not be treated as the only lever. In Tanzania, housing and educational opportunities increased nursing students' stated willingness to accept remote work [28]. In Zambia, housing, educational incentives, and facility improvements influenced the choice of hypothetical rural posts [29]. Among health professionals already working in difficult-to-staff areas of Senegal, contract security, basic equipment, and training opportunities contributed to willingness to stay [30]. A natural experiment in Australia found that rural financial incentives increased the number of general practitioners in newly eligible areas but produced limited evidence of improved patient access, suggesting that financial incentives alone may have limited reach [31].

The prominence of equipment and clinical infrastructure is particularly relevant to ophthalmology. A specialist may be physically present in an underserved location yet unable to provide the intended scope of care if diagnostic equipment, operating-room support, trained personnel, medicines, or referral pathways are inadequate. A qualitative study of the rural eye-care workforce in Western Australia described barriers related to service access and workforce support, while a scoping review of rural ophthalmology linked workforce development with service-delivery models, training, and collaboration between eye-care professionals [15, 16]. Comparable concerns were reported by young Nepalese doctors undertaking mandatory bonded service, who described limits imposed by infrastructure and equipment as well as concerns about professional development and compensation [32]. In rural Tanzanian clinics, equipment and infrastructure formed one of the main dimensions of workplace dissatisfaction [33].

Professional support was another recurring issue. Participants mentioned workload, on-call duties, staff shortages, lack of replacement cover, limited study opportunities, and inadequate supervision. Among rural medical specialists, workload, on-call commitments, workplace relationships, continuing professional development, family circumstances, and employment flexibility influenced decisions to remain or leave [14]. In South African community service, satisfaction with supervision was associated with reported professional development and with intention to remain at the same facility, and reported professional development was associated with intention to continue working in rural or underserved communities [34]. Medical school graduates reflecting on compulsory rural service completed as students in Guatemala described professional growth alongside limited supervision [35].

A literature-based proposal for mentoring rural and remote health professionals whose proposed model had not yet been evaluated [36], and a Norwegian longitudinal evaluation of rural postgraduate training in which 65–67% of physicians were still working in the county five years after completing the group tutorial [37], suggest that mentoring, peer networks, and in-service training may help address professional isolation and support retention.

The social and family concerns reported by participants also have parallels in the literature. Place attachment, community integration, family needs, and previous rural exposure have been associated with rural workforce decisions in several settings [38–40]. Although previous work in an underserved area was recorded in the current study, place attachment, community integration, and family-related influences were not assessed using dedicated measures, and none was identified as a separate final driving force. Their relationship to future service and retention warrants further evaluation.

The governance and legal findings require careful interpretation. Participants questioned aspects of allocation, exceptions, supervision, insurance, private-practice restrictions, and consistency of program rules. These accounts do not establish misconduct: they show that some participants perceived problems of fairness, transparency, or administrative consistency. Qualitative studies elsewhere have linked perceived organizational injustice with health-worker motivation [41], and delayed claims, limited transparency, and poor working conditions with health-worker motivation and retention concerns [42]. A qualitative study of rural doctors in Vietnam also found that income, workload, equipment, supervision, professional relationships, career development, training, and living conditions were considered together when doctors discussed rural practice [39].

The ethical dimension of compulsory service is also relevant. Doctors who had completed compulsory community service in South Africa could accept the social purpose of the policy while questioning aspects of autonomy, justice, and accountability [43]. That distinction resembles the views expressed by several participants here, particularly the comment that the conditions should be attractive enough for clinicians to choose underserved service rather than rely on compulsion alone.

Two of the identified driving forces—service-recipient satisfaction and physician's social satisfaction—warrant particular caution. Neither was quantitatively measured using a validated instrument in this study. Their selection reflects expert judgment about the future of the program. Research from rural primary care nevertheless shows that professional development, workplace relationships, community recognition, infrastructure, and working conditions are relevant to health-worker motivation and satisfaction [33, 40]. These studies provide contextual support for the physician/workforce-satisfaction component but do not validate either expert-selected satisfaction driving force or quantify its effect on compulsory-service outcomes.

The macro-level forces—sanctions, political and social stability, epidemics and emerging diseases, social demand for free medical services, and the national health profile—describe the environment in which the program operates rather than physician-level determinants. Their inclusion is consistent with environmental scanning and PESTEL, which are used to examine broad external conditions and identify factors likely to shape future change [17, 22]. The current

study did not estimate the magnitude of these effects.

Finally, compulsory placement and long-term retention should be kept separate. In China, graduates in a compulsory rural-service program were more likely to work initially in township health centers, but follow-up showed that retention after the obligation was substantially lower [44, 45]. A 15-year review of compulsory community service in South Africa likewise found evidence of redistribution and professional development, while only a minority consistently intended future rural or underserved work [46]. The finding that 13 of 18 participants (72.2%) here would consider service after correction of major problems therefore represents conditional willingness in this sample and should not be treated as a prediction of long-term retention.

The study combined environmental scanning, interviews, PESTEL classification, expert assessment, and panel identification of driving forces. This sequence allowed the analysis to move from a broad list of concerns to a smaller set of factors judged relevant to the future of the program. The study also contributes ophthalmology-specific perspectives to a literature that has largely focused on broader medical and health-workforce populations.

Several limitations should be considered. The interview sample was small and purposive, and all 18 interviewees were ophthalmologists. Their views cannot be considered representative of all healthcare workers. Six participants had not personally worked in an underserved area, though they were familiar with the conditions through professional contacts. The expert-panel findings were based on the judgment of five experts with complementary backgrounds and should thus be interpreted as an expert assessment rather than as a statistically representative or formally established consensus.

Several reported challenges, including payment delays, resource shortages, and concerns about fairness or management, were based on participant accounts and were not independently verified against institutional records. Strong statements made by individual participants therefore remain perceptions. The PESTEL classification and the final driving forces reflect expert judgment; they do not establish causal relationships or quantify the effect of each force on recruitment, service quality, or retention.

Conditions of service and the wider policy environment can also change over time. The identified driving forces are best treated as a framework for policy review and future empirical testing. Prospective work could examine their association with successful placement, the capacity to deliver the intended service, and retention after compulsory service.

CONCLUSIONS

Financial and management or implementation problems were the most frequently categorized immediate challenges among the interviewed ophthalmologists, and most participants considered the compulsory service program in need of redesign. The expert panel identified 10 driving forces spanning national infrastructure, welfare and financial support, international sanctions, policy commitment, political and social stability, social demand for free medical services, epidemics and emerging diseases, service-recipient and physician satisfaction, and population and disease patterns. The findings indicate specific areas for policy review, particularly payment and welfare arrangements, clinical infrastructure, supervision, professional support, and consistency of program implementation. The driving forces should be treated as expert-identified areas for future evaluation rather than as established causal determinants. Future studies should examine them prospectively and distinguish successful deployment from the ability to provide the intended service and from retention after the compulsory period.

ETHICAL DECLARATIONS

Ethical approval: The study received institutional and departmental approval. Informed consent was obtained before participation. Participants were informed that interviews would be recorded, that their information would be treated confidentially, and that findings would be reported anonymously. Potentially identifying contextual details were generalized or omitted from reported quotations and participant descriptions where necessary to protect confidentiality. Illustrative quotations used in the manuscript were translated from Persian into English and kept as close as possible to their original meaning.

Conflicts of interest: F.H. is associated with the IVORC Academic Foundation and its affiliated journals. However, in accordance with journal policy, articles submitted by the board, staff, or editor-in-chief undergo peer review to maintain impartiality. These submissions are managed by a different editorial board member with no conflicts of interest, ensuring that those with potential conflicts are excluded from the process. Furthermore, the editor overseeing the review process remains blinded to the reviewers' identities.

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