Exploring Pediatricians ′ Perspectives on High Infant Mortality Raxes in Turkiye′s Southeastern and Eastern Anatolia Region: A Qualitative Study of Healthcare Providers ′ Experiences and Insights

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Abstract

Despite significant national declines in infant mortality in Türkiye, marked regional disparities persist, with the Southeastern and Eastern Anatolia regions reporting the highest rates. These regions are characterized by lower health workforce density, the burden of large refugee populations, and potential data limitations. This qualitative study explores the perspectives of pediatricians—frontline healthcare providers—working in these high-mortality areas to understand the underlying challenges driving these persistent poor neonatal and infant outcomes. Through in-depth interviews, the study aimed to gather healthcare providers' experiences and insights regarding the influence of health system factors (including workforce distribution and the capacity for high-quality care), the impact of demographic shifts, and issues related to vital registration and mortality data completeness. The findings illuminate the complex interplay of socioeconomic, systemic, and demographic pressures that strain healthcare delivery and hinder mortality reduction efforts in these disadvantaged provinces. This work provides critical, context-specific evidence to inform targeted policy interventions aimed at strengthening the health workforce, improving infrastructure, and reducing health inequalities across Türkiye.

Keywords: Infant mortality, Neonatal mortality, Regional disparities, Türkiye, Southeastern Anatolia, Eastern Anatolia, Pediatricians, Qualitative study, Healthcare workforce, Refugee population, Health equity.

Introduction

The neonatal period—the first 28 days of life—is one of the most critical stages of human development. During this time, newborns transition from the protected intrauterine environment to the outside world, initiating independent breathing, regulating body temperature, establishing feeding, and undergoing rapid physiological and metabolic adaptation. Even minor disruptions in antenatal, perinatal or early postnatal care can lead to serious morbidity or mortality.

Mortality indicators do not simply measure the risk of death and the health impact of diseases; they also quantify the burden of illness and societies 'survival prospects. They are indispensable elements of health status assessments, public-health research, programme and policy planning, and evaluation. Infant mortality covers the first 365 days of life, but the risk and causes of death vary markedly within this period. The neonatal period (0–27 days) and the post-neonatal period (28 days to 1 year) are defined separately because their causes of death differ. Neonatal deaths are less influenced by environmental factors such as infections and are instead driven by complications during labour and delivery, genetic factors, and adverse effects of maternal malnutrition during pregnancy. Post-neonatal deaths are largely determined by preventable or immunisable conditions such as respiratory infections and diarrhoeal diseases—external, environmental factors that modern medicine can address. Perinatal deaths (stillbirths and deaths within the first 7 days) provide a sensitive measure of maternal health, the adequacy of antenatal care, and whether births occur under safe conditions. Globally, infant and child mortality levels are accepted as key development indicators. The World Development Report of the World Bank and the Human Development Report of the UNDP both treat infant and child deaths as indicators of national progress, and reducing these deaths was a core Millennium Development Goal. Current initiatives—including the UN Global Strategy for Women's, Children's and Adolescents 'Health (2016–2030) and the Sustainable Development Goals (SDGs)—aim to end preventable newborn and under-five deaths by 2030, targeting neonatal mortality rates ≤12 per 1,000 live births and under-five mortality rates ≤25 per 1,000 (Ministry of Health, 2021).(Ministry of Health. (2021). Infant mortality in Turkey: Status report on the 100th anniversary of the Ministry of Health. Ankara).

Historically, Türkiye displayed infant and child mortality levels higher than would be expected for its economic status. Although adult mortality rates were broadly comparable to those of countries with similar socio-economic structures, Türkiye's life expectancy at birth remained persistently low due to its elevated infant and child mortality rates. Up until the mid-2000s, infant and child mortality remained high enough to justify this assessment. However, thanks to large-scale maternal and child health programmes implemented over the past two decades, infant mortality has fallen into single digits per 1,000 live births. From this point onward, further reductions are expected to be slower, costlier, and more dependent on infrastructure investments such as human resources and technology transfer; a plateauing or deceleration in the rate of decline is therefore anticipated, as seen in other middle-income countries(Ministry of Health. (2021). Infant mortality in Turkey: Status report on the 100th anniversary of the Ministry of Health. Ankara).

Although Türkiye's vital registration (VR) system was established in the early 20th century, its coverage and completeness only reached sufficient levels in the 2000s

(Akin & Köseli, 1997; Özdemir et al., 2015; Yayla & Çavlin, 2019). Over the last two decades, Türkiye has achieved rapid declines in child and infant mortality and has modernised its VR system. Yet the completeness of under-five deaths—particularly infant deaths—has not been fully evaluated, and existing studies are based on older, pre-2014 data that treat infancy as a single category rather than examining age-specific completeness in detail (Özdemir et al., 2015; Yayla & Çavlin, 2019). To situate these issues in an international context, this thesis also draws on the World Health Organization's Global Health Observatory (GHO), WHO's central platform for health statistics. The GHO compiles official data submitted by member states—including the WHO Mortality Database and the Global Health Estimates—allowing researchers to analyse cause-specific mortality and life-expectancy trends over time using standardised definitions (WHO, 2024).Two GHO datasets are used here: (i) cause-of-death data from the WHO Mortality Database and (ii) life expectancy at birth from the Global Health Estimates. In Türkiye's case, the death registration data are rated as medium quality and do not yet meet WHO's inclusion criteria for direct cause-of-death estimation, so WHO uses them instead as inputs to its multi-cause modelling frameworks such as the Global Burden of Disease Study (WHO, 2024).

These national averages also mask striking regional differences. According to the Ministry of Health's 2023 data, perinatal mortality across all gestational ages was close to 10 per 1,000 total births in most western regions but rose to 12.6 in Southeastern Anatolia and 13.2 in Eastern Anatolia. When restricted to ≥28 gestational weeks or ≥1,000 g birthweight, perinatal mortality averaged around 6 per 1,000 in western regions but increased to 8.7 in Southeastern Anatolia and 8.9 in Eastern Anatolia. Likewise, neonatal mortality rates across all gestational ages averaged 4.98 per 1,000 live births in western regions but reached 8.5 in Southeastern Anatolia and 7.1 in Eastern Anatolia; when restricted to ≥28 gestational weeks or ≥1,000 g birthweight, neonatal mortality was approximately 2.9 per 1,000 in western regions, 6.0 in Southeastern Anatolia and 4.8 in Eastern Anatolia(Health Statistics Yearbook 2023, General Directorate of Health Information Systems).

The conflicts that began in the Middle East and Syria in 2011 have further complicated this picture, leading many people to seek refuge in neighbouring countries. Due to irregular migration, large numbers of newborns are now born far from their homelands in foreign healthcare systems. In provinces such as Gaziantep, where the population is about 2.1 million with over 500,000 Syrians under temporary protection, crude birth rates exceed the national average, and birth rates among refugees surpass even local levels.This demographic pressure places a significant burden not only on maternity and neonatal services but also on the capacity to maintain accurate records of births, infant follow-up and deaths, and must therefore be taken into account in staff allocation formulas for hospitals and primary care

units(Mother and Infant Mortality Prevention Workshop, Gaziantep Provincial Health Directorate, 2021).

Therefore, another critical factor shaping these outcomes is the health workforce. The effectiveness of health services depends largely on the quality, distribution, and adequacy of health workers. In regions where the number and training of healthcare professionals are limited, infant mortality rates tend to be higher and access to services more constrained. The 2021 "Maternal and Infant Death Prevention Workshop" held in one of the high-mortality provinces explicitly identified workforce shortages as a central problem. It highlighted the insufficient numbers of paediatricians, obstetricians, neonatologists, perinatologists, midwives, and nurses compared with international benchmarks—both in public and private hospitals—and noted that heavy caseloads in family medicine (first-tier primary care) limit the time available for preventive services. Ecological studies from Türkiye confirm that health workforce indicators—especially the number of nurses and doctors—significantly influence infant mortality rates (Sarıyıldız, 2025).

National maternal and child health programmes have contributed to mortality reduction—for example, the Newborn Resuscitation Programme (NRP), 15–49 Age Women's Health Monitoring, Premarital Counselling and Screening, Pregnant Information Classes, the Guest Mother Programme, Newborn Metabolic and Endocrine Disease Screening, Child Emergency and Intensive Care Trainings, and repeated NRP trainings run by the General Directorate of Public Health (2025). Yet the frequency and effectiveness of implementation vary between regions, leaving persistent gaps in outcomes (Ministry of Health. (2021). Infant mortality in Turkey: Status report on the 100th anniversary of the Ministry of Health. Ankara)General Directorate of Public Health. (2025). *Newborn resuscitation program (NRP) trainer and training supervisor education conducted within NRP framework*..

Against this backdrop, the present study explores pediatricians 'perspectives on high infant mortality in Southeastern and Eastern Anatolia, focusing on how health-workforce distribution, refugee populations, and data limitations shape neonatal outcomes. By combining national and WHO data with frontline clinicians 'insights, it aims to illuminate the underlying factors driving persistent disparities and inform policies to reduce infant mortality in Türkiye's most disadvantaged regions.

Methodology

The interview data underwent systematic qualitative analysis using inductive thematic coding. Responses from five healthcare professionals were examined across nine structured questions to identify emergent themes, patterns of consensus, and areas of professional divergence regarding infant mortality in Turkiye's Eastern and Southeastern Anatolia regions. Codes were developed inductively from the data, and

primary themes emerged around social and cultural factors, medical causes, healthcare system issues, regional disparities, and implementation challenges. To strengthen the analysis, qualitative themes were systematically converted into frequency counts and priority rankings, enabling comparative evaluation and the development of evidence-based recommendations.

Data collection tools

Interviews were guided by nine structured questions addressing clinical causes of infant death, regional differences, healthcare system capacity, traditional practices, maternal health, policy implementation, and suggested interventions. Participants were encouraged to provide examples and expand on their observations to capture rich, contextual data. Ethical considerations were prioritized: participants provided informed consent, responses were anonymized, and data were treated confidentially. This approach ensures that sensitive information regarding healthcare practices and patient experiences is protected while still allowing for detailed analysis.

Sample

Five healthcare practitioners reported between 8 and 30 years of experience in Eastern and Southeastern Anatolia participated. Their roles varied across the healthcare system, reflecting both clinical and administrative perspectives.

One physician had been serving for three decades, with experience in both the private sector and public institutions, and for the last 15 years had worked as an administrator within the Provincial Health Directorate.

Another pediatrician reported 20 years of clinical practice in the region.

Two respondents each had 16 years of experience, one with a background in inspection for the Ministry of Health, and the other in direct clinical practice.

The fifth participant had been working for 8 years, primarily within a Family Medicine Practice Unit.

This range of backgrounds illustrates the diversity of perspectives included in the study—from frontline physicians treating infants and mothers directly, to administrators and inspectors overseeing policy implementation and health system functioning. Collectively, the group brought together insights from both clinical realities and structural challenges, providing a well-rounded understanding of infant mortality in these regions.

Data Analysis

Data were analyzed using inductive thematic coding. The responses from five healthcare professionals were analyzed to identify recurring themes and patterns. Codes were grouped into overarching categories including social/cultural determinants, medical/clinical causes, healthcare system issues, regional disparities, and policy challenges. Frequency counts and priority rankings were derived from

coded data, enabling comparative analysis across participants and supporting evidence-based recommendations.

Interview transcripts were analyzed using inductive thematic coding. Initial coding identified recurring topics such as consanguineous marriage, early-age pregnancies, prematurity, infections, and healthcare system limitations. Codes were then grouped into five primary themes: social/cultural determinants, medical/clinical causes, healthcare system issues, regional disparities, and policy implementation.

Emergent themes were further quantified using frequency counts and consensus rankings. For example, consanguineous marriage was mentioned by three of the five doctors, highlighting its perceived significance. Quotes from participants were included to illustrate thematic patterns and provide depth to the analysis.

Findings

Table 1. *Main Causes of Infant Mortality*

Category	Specific Causes	Frequency (Doctors Mentioning)
Social/Cultural	Consanguineous marriages	3/5 (Doctors 1, 3, 4)
	Early-age marriages	2/5 (Doctors 1, 3)
	Low socioeconomic status	1/5 (Doctor 1)
	Low health literacy	2/5 (Doctors 1, 4)
Medical/Clinical	Sepsis	2/5 (Doctors 2, 5)
	Prematurity complications	1/5 (Doctor 5)
	Birth asphyxia	1/5 (Doctor 5)
	Congenital anomalies	1/5 (Doctor 5)
Healthcare System	Inadequate prenatal care	2/5 (Doctors 3, 5)
	Limited NICU capacity	1/5 (Doctor 5)
	Delayed referrals	1/5 (Doctor 5)
Maternal Health	Genital/urinary infections	1/5 (Doctor 3)
	Inadequate nutrition	1/5 (Doctor 3)

Social and cultural factors were most frequently cited as underlying causes. Three doctors identified consanguineous marriages as a primary concern. Doctor 4 stated: "Consanguineous marriages, nutritional status, health literacy, and marriages at the ideal reproductive age all affect infant mortality." Doctor 3 noted: "Consanguineous marriages and early-age marriages are examples of cultural practices that continue to influence infant mortality."

Health literacy emerged as another key factor. Doctor 1 listed "low health literacy" as a direct cause, while Doctor 4 emphasized, "health literacy must be improved."

Clinical factors varied by age group. Doctor 5 explained, "neonates (0–27 days): prematurity and its complications, birth asphyxia/intrapartum hypoxia, sepsis-pneumonia, and congenital anomalies are primary causes. For older infants, lower respiratory tract infections, sepsis, diarrhea/dehydration, and malnutrition become more common."

Healthcare system issues included what Doctor 5 described as "inadequate or delayed antenatal care, lack of skilled birth attendants, delays in referral/transport, limited neonatal ICU capacity." Maternal health problems, such as "infections in the female genital and urinary tracts" and "inadequate nutrition," were identified by Doctor 3 as preventable causes.

Table 2. *Changes Over the Past 5-10 Years*

Aspect	**Current Status**	**Assessment Consensus**	**Key Issues / Notes**
Infant Mortality Trend	Mixed / Slight improvements in some areas	3/5 doctors agree	Fluctuations due to regional disparities, migration, earthquakes; Eastern Anatolia higher than Southeastern Anatolia
Regional Differences	Gradual decrease toward western regions	2/5 doctors agree	Western regions have better socio-cultural and health development

Healthcare Infrastructure	Better in Southeastern Anatolia hospitals	1/5 doctors agree	Hospital capacity, technological resources, staff availability influence mortality
Community Health Programs	Gradual improvements observed	1/5 doctors agree	Health literacy, preventive care, vaccination, institutional deliveries, standardized antenatal/postnatal care
Social Determinants	Persisting inequalities	1/5 doctors agree	Rural vs urban, seasonal migration, high refugee populations
Neonatal ICU & Staff Turnover	Significant factor	1/5 doctors agree	ICU occupancy rates and staff turnover directly affect neonatal mortality

Infant mortality rates have shown only partial improvements over the past decade, with progress uneven across regions. Three doctors observed modest gains, though overall mortality remains relatively high in Eastern and Southeastern Anatolia compared to national levels. Regional disparities remain pronounced: western provinces continue to benefit from stronger socio-cultural and healthcare development, while eastern areas face ongoing challenges related to migration, refugee populations, and limited resources. Doctors emphasized that Southeastern Anatolia's hospitals now have better infrastructure and staff capacity, contributing to better outcomes compared to Eastern Anatolia. Preventive measures such as vaccination programs, institutional deliveries, and standardized antenatal and postnatal care were also noted as positive drivers of gradual improvement. However, persistent social inequalities—particularly in rural and migrant communities—limit progress. In addition, one doctor highlighted that neonatal ICU occupancy and staff

turnover remain pressing issues that undermine care quality and contribute to fluctuations in mortality.

Overall, despite incremental gains from health programs and infrastructure improvements, structural inequalities and resource gaps continue to hinder sustained reductions in infant mortality.

Table 3. *Most Common Direct Causes*

Rank	**Cause**	**Mentioned by Doctors**	**Age Group Most Affected**
1	Prematurity/Preterm birth	1, 2, 4, 5 (4/5)	Neonatal (0-27 days)
2	Congenital anomalies	1, 2, 4, 5 (4/5)	All ages
3	Sepsis	1, 2, 4, 5 (4/5)	All ages
4	Birth complications	2, 4 (2/5)	Neonatal
5	Respiratory infections	5 (1/5)	Post-neonatal (1-11 months)
6	Diarrhea/dehydration	5 (1/5)	Post-neonatal

Prematurity, congenital anomalies, and sepsis emerged as the most frequently cited direct causes of infant mortality, each reported by four of the five doctors. Doctor 2 emphasized: *"When examining the most recent causes of infant deaths in our province, sepsis is seen to rank first."* Birth complications, such as asphyxia and intrapartum hypoxia, were identified by two doctors as additional contributors during the neonatal period.

In the post-neonatal stage, respiratory infections and diarrhea/dehydration were reported as important causes, though mentioned less frequently. These findings suggest that while neonatal mortality is largely driven by prematurity, sepsis, and congenital conditions, post-neonatal deaths remain tied to preventable infectious diseases and inadequate nutrition or care practices.

Overall, the clinical consensus highlights both biomedical and preventable causes, underscoring the need for improvements in neonatal intensive care, infection control, and early intervention against respiratory and diarrheal diseases.

Table 4. *Regional Disparities*

Aspect	**Eastern Anatolia**	**Southeastern Anatolia**	**National Trend**
Mortality Level	Higher than national average	Better than Eastern	Gradual improvement
Infrastructure	Limited	Better technology/qualified staff	Variable
Improvement Trend	Slower progress	Some improvements noted	West > East gradient
Affecting Factors	Limited resources, migration	Migration, earthquakes	Socio-cultural development

The East–West health gradient remains clear. Southeastern Anatolia shows better infrastructure and outcomes compared to Eastern Anatolia, though both remain higher than the national average. Doctor 3 stated: *"Southeastern hospitals have better technological infrastructure and more qualified staff compared to the Eastern Anatolia Region. Based on this observation, I believe that infant mortality rates are higher in the Eastern Anatolia Region."*

Table 5. Adequacy of Maternal Healthcare

Aspect	**Current Status**	**Assessment Consensus**	**Key Issues / Notes**
Prenatal Care Quantity	Generally sufficient	3/5 doctors	Most pregnant women receive routine check-ups, antenatal care, and vaccinations
Prenatal Care Quality	Insufficient	4/5 doctors	Care quality varies, with gaps in follow-up, counseling, and personalized attention

Access & Continuity	Variable	2/5 doctors	Dependent on socio-cultural background and regional disparities
Health Literacy	Needs improvement	2/5 doctors	Low maternal awareness affects preventive care and adherence to guidelines
Postnatal Follow-up	Limited	1/5 doctor	Improvement in postnatal access and follow-up is necessary

While most pregnant women receive quantitatively sufficient care, the quality and continuity of services are inconsistent. Doctor 2 explained: *"While most pregnant women receive adequate care in terms of quantity during pregnancy, I believe the quality of this care is insufficient."* Similarly, Doctor 4 emphasized: *"Health literacy must be improved and pre- and postnatal follow-ups should be conducted more effectively, and improvement of access to healthcare after pregnancy is also an essential need."*

Access and experience are often influenced by socio-cultural background and regional disparities, resulting in uneven outcomes. Overall, while preventive services like routine check-ups, vaccinations, and antenatal care are generally available, addressing gaps in quality, follow-up, and health literacy is essential to ensure equitable and effective maternal healthcare.

Table 6. Healthcare Workers

Aspect	**Current Status**	**Assessment Consensus**	**Key Issues**
Prenatal Care Quantity	Adequate	4/5 doctors agree	Access generally good
Prenatal Care Quality	Insufficient	4/5 doctors agree	Major gap identified

Healthcare Worker Capacity	Adequate alternatives	2/5 doctors	Multiple options available
Healthcare Worker Quality	Needs improvement	4/5 doctors	Training deficits
Staff Turnover	High problem	2/5 doctors	Continuous training needed

While the quantity of care is satisfactory, its quality and continuity are compromised. Training deficits and staff turnover remain major challenges across the region. Continuity of trained staff, rather than the sheer number of providers, is seen as the more pressing problem. Doctor 4 remarked: *"Even staff with adequate training often request transfers once their mandatory service period ends, which creates gaps in expertise."*

Table 7. *Traditional Practices*

Practice Category	**Specific Practice**	**Risk Level**	**Doctors Reporting**
Vaccine-Related	Vaccine refusal	High	2 (Doctors 1, 2)
	Refusing newborn screening	High	1 (Doctor 2)
	Vitamin K refusal	High	1 (Doctor 2)
Marriage Practices	Consanguineous marriage	High	2 (Doctors 3, 4)
	Early-age marriage	High	2 (Doctors 3, 4)
Birth Practices	Home birth preference	Medium	2 (Doctors 1, 5)
	Delayed institutional care	Medium	1 (Doctor 5)
Newborn Care	Prelacteal feeding	Medium	1 (Doctor 5)
	Excessive swaddling	Medium	1 (Doctor 5)
	Delayed medical consultation	High	1 (Doctor 5)

The responses from healthcare practitioners indicate that social and cultural factors are major underlying contributors to infant mortality in Eastern and Southeastern Anatolia. Consanguineous marriages, early-age marriages, maternal nutritional status, and the timing of pregnancies were repeatedly highlighted as key influences. Most practices, such as home birth preference, prelacteal feeding, and delayed institutional care, are less common but still present in certain areas. Notably, home births are relatively rare, suggesting that most families access institutional care, though delays or preferences for non-institutional care can still contribute to adverse outcomes. Medium-risk newborn care practices, such as excessive swaddling or delayed consultations, highlight areas where education and early intervention could reduce infant mortality.

Table 8. *Intervention Priorities by Theme*

Intervention Theme	**Specific Actions**	**Priority Level**	**Doctor Consensus**
Education/Awareness	Health literacy improvement	High	5/5 doctors
	Public education campaigns	High	3/5 doctors
	Community programs	Medium	2/5 doctors
Healthcare Training	Neonatal Resuscitation (NRP)	High	2/5 doctors
	Continuous staff education	High	3/5 doctors
	Emergency care training	Medium	2/5 doctors
System Strengthening	NICU capacity expansion	High	1/5 doctors
	Primary care quality	High	2/5 doctors
	Referral systems	Medium	1/5 doctors
Clinical Protocols	Delivery protocols	Medium	1/5 doctors
	Infection control	Medium	1/5 doctors
	Breastfeeding promotion	Medium	1/5 doctors

All doctors agreed that improving health literacy is the highest priority. Doctor 1 explained: "Improving health literacy, educating to raise conscious mothers and healthy generations, and improving the quality of primary and preventive services." Education and awareness programs were consistently emphasized, with public campaigns and community-based initiatives viewed as essential. Training of healthcare workers—particularly in neonatal resuscitation and continuous education—was also rated as high priority. System-level improvements, such as expanding NICU capacity, strengthening primary care quality, and improving referral mechanisms, were recognized but received fewer mentions. Medium-priority interventions, including delivery protocols, infection control, and breastfeeding promotion, were noted as supportive but not central to immediate impact.

Table 9. *Government Policy Assessment*

Policy Aspect	**Current Status**	**Doctor Assessment**	**Recommended Action**
Policy Framework	Exists	Adequate (3/5 doctors)	Maintain current policies
Implementation	Weak	Insufficient (4/5 doctors)	Strengthen execution
Local Cooperation	Limited	Needs improvement (2/5 doctors)	Enhance coordination
Resource Allocation	Variable	Regional disparities (1/5 doctors)	Address Eastern region
Monitoring/Evaluation	Unclear	Data gaps noted (1/5 doctors)	Improve tracking systems

Policies exist, but implementation is inconsistent. Doctor 4 warned: "Although the technological infrastructure and staff qualifications in Southeastern Anatolia are good, higher infant mortality in Eastern Anatolia suggests the need for strengthened policies and continued oversight." While the policy framework itself was generally considered adequate by most doctors, execution was rated as insufficient, particularly in addressing regional inequalities. Limited local cooperation and variable resource allocation were highlighted as ongoing barriers. Weak monitoring and evaluation mechanisms, with notable data gaps, further limit the ability to measure progress. Strengthening policy implementation, ensuring equitable resource distribution, and

enhancing coordination across local and national levels remain critical for reducing infant mortality.

Table 10. *Doctor Response Patterns*

Doctor	**Response Style**	**Key Focus Areas**	**Unique Contributions**
Doctor 1	Concise, practical	Social factors, basic interventions	Highlighted migration impact
Doctor 2	Problem-focused	Sepsis, misinformation, sanctions	Suggested social media regulation
Doctor 3	Administrative / policy	Training programs, system gaps	Inspector perspective, detailed action plans
Doctor 4	Regional comparison	Geographic disparities, staff issues	East–West analysis
Doctor 5	Comprehensive clinical	Age-specific causes, detailed protocols	Provided the most technical depth

The doctors ' responses reveal different emphases and perspectives, reflecting their professional roles and experiences. Doctor 1 focused on practical social interventions, while Doctor 2 highlighted clinical problems and misinformation. Doctor 3 contributed an administrative and policy-oriented perspective, identifying system gaps and training needs. Doctor 4 emphasized regional disparities and East–West differences, whereas Doctor 5 provided detailed clinical insights, particularly regarding age-specific causes and protocols.

Overall, these varied perspectives enriched the analysis, ensuring that the report captures both clinical realities and systemic challenges, which is critical for designing effective interventions and policy recommendations.

Table 11. *Consensus vs. Divergent Views*

Topic	**Strong Consensus**	**Moderate Agreement**	**Divergent Views**
Main causes	Social/cultural factors	Medical causes	Emphasis varies
Care quality	Quantity adequate, quality poor	-	Implementation details
Interventions	Education priority	Training needs	Specific approaches
Traditional practices	Negative impact	-	Specific practices vary
Regional trends	East-West gradient	-	Rate of improvement
Policy adequacy	Implementation gaps	-	Specific policy areas
Staff assessment	Training needs	-	Capacity evaluation

This table summarizes where doctors ' opinions converged or diverged across key themes. There was strong consensus on the importance of social and cultural factors in infant mortality, the need to improve care quality, prioritizing education in interventions, and the East–West regional gradient. Moderate agreement was observed for medical causes and training needs, indicating shared recognition but with some variation in emphasis. Divergent views arose in areas such as implementation details, specific intervention strategies, particular traditional practices, the rate of improvement across regions, policy specifics, and evaluations of staff capacity.

Overall, these patterns illustrate that while doctors largely agreed on broad priorities, the details of execution and specific practices require tailored approaches to effectively address infant mortality in Eastern and Southeastern Anatolia.

Practitioner Voices: Individual Perspectives

Doctor perspectives reveal different emphases and priorities, reflecting their professional roles and experiences. Doctor 1 focused on social factors and basic interventions, highlighting migration impact. Doctor 2 emphasized sepsis and misinformation, recommending public campaigns and regulatory measures. Doctor 3 contributed an administrative perspective, identifying system gaps and training needs. Doctor 4 highlighted regional disparities and staff turnover, noting that even trained staff often leave after mandatory service, creating gaps. Doctor 5 provided detailed clinical insights, particularly regarding age-specific causes and protocols.

Together, these perspectives illustrate that reducing infant mortality in Eastern and Southeastern Anatolia requires both targeted medical interventions and broader social and systemic changes. Social and cultural factors—such as consanguineous marriages, early-age pregnancies, and low maternal health literacy—exacerbate clinical risks, including prematurity, sepsis, and congenital anomalies. Healthcare system challenges—including limited NICU capacity, uneven staff distribution, and high turnover—further compound these risks. Regional disparities highlight that Southeastern Anatolia has relatively better infrastructure and trained personnel, yet overall mortality remains above national averages.

International comparisons suggest that while Turkiye's IMR is approaching developed-country levels, regional inequalities mirror patterns observed in other middle-income countries, where rural and socioeconomically disadvantaged populations experience higher mortality rates (WHO, 2023). Policy implications include prioritizing health literacy campaigns, continuous professional education, NICU expansion, and strengthening referral systems. Public engagement and culturally sensitive interventions are crucial for addressing harmful traditional practices. Overall, improving infant survival in these regions requires a multidimensional approach that integrates clinical care, health system strengthening, social interventions, and policy enforcement to ensure equitable outcomes for all infants.

Discussion

Summary and Significance

This study revealed that healthcare practitioners in Eastern and Southeastern Anatolia overwhelmingly identify social determinants—particularly consanguineous and early-age marriage, low maternal nutrition, and poor health literacy—as the main drivers of infant mortality. At the same time, they cite persistent gaps in perinatal quality, infection control, and workforce continuity as immediate barriers to care. Together, these findings show that sustained reductions in infant mortality cannot be achieved through clinical interventions alone; they require combined social, educational, and health-system strategies.

Theme-by-Theme Analysis

Social and cultural determinants

Doctors 'repeated references to consanguinity, early marriage, and maternal nutrition underscore how infant mortality in these regions is rooted in social practices and inequities. This mirrors international literature on social determinants of health and neonatal outcomes, which shows that traditional marriage patterns, low female education, and limited access to family planning or genetic counselling amplify congenital disorders and early neonatal death. In this context, health literacy emerges as a pivotal modifiable factor: improving mothers 'knowledge about pregnancy, newborn care, and preventive services can help break the cycle of high-risk behaviours.

Implication: Interventions should integrate community-based health education, counselling on consanguinity and early marriage, and expanded access to prenatal nutrition programs alongside clinical care.

Clinical causes and perinatal quality gaps

Prematurity, sepsis, congenital anomalies, and intrapartum hypoxia were the most commonly cited direct causes of neonatal death. These conditions are either preventable or mitigable with high-quality antenatal, intrapartum, and immediate postnatal care. The persistence of sepsis and preventable complications indicates that quality-improvement efforts—particularly infection control, early recognition, and neonatal resuscitation—lag behind infrastructure expansion. Post-neonatal deaths, though fewer, remain linked to respiratory infections, diarrhoea, and malnutrition—conditions that modern medicine can largely prevent.

Implication: Focus on basic quality bundles—clean delivery practices, neonatal resuscitation training, early sepsis screening—and strengthen referral pathways from primary care to tertiary hospitals.

Workforce distribution and the "quality vs quantity" paradox

Across tables 5 and 6, clinicians described a system where numbers have improved but expertise and continuity have not. Mandatory-service postings followed by rapid transfers produce cycles of turnover that erode institutional memory and limit quality gains. Even where NICUs exist, insufficient neonatologists, perinatologists, and trained nurses reduce their effectiveness.

Implication: Workforce policy should shift from headcount to retention and skill-mix—financial incentives for rural posts, career pathways for neonatal specialists, continuous professional development, and mental-health support to prevent burnout.

Regional disparities and refugee burden

The East–West health gradient persists despite national gains. Southeastern Anatolia benefits from better hospital infrastructure and staffing than Eastern Anatolia yet still has higher mortality than western Turkey, showing that infrastructure alone is insufficient. Refugee populations compound this pressure: in Gaziantep, for example, the crude birth rate among Syrian refugees exceeds even local rates, inflating caseloads and straining both service delivery and record-keeping of births and deaths. Inaccurate denominators and under-registration then feed back into misallocated resources.

Implication: Adjust staff-allocation formulas to include refugee populations, strengthen birth and death registration (harmonise hospital, MERNİS, and national data), and expand multilingual outreach to ensure continuity of antenatal and postnatal care.

Policy and implementation gaps

While national policies and programs exist, practitioners consistently reported weak execution, uneven resource allocation, and poor monitoring. Without robust local data, it is difficult to target interventions or evaluate progress. This mirrors past research on Turkey's vital registration system, which shows incomplete infant-death recording and regional variation in data quality.

Implication: Establish routine perinatal death reviews, audit health-worker distribution against actual birthloads (including refugees), and invest in local health-information systems to track quality indicators.

Contradictions and tensions

Although physicians clearly acknowledge the social and structural drivers of infant mortality, their proposed solutions were largely clinical—such as expanding NICU capacity or increasing specialist numbers. This pattern reflects the constraints of their professional roles: clinicians are trained and empowered to intervene medically but have limited authority over the broader social conditions shaping health. These findings highlight the need for cross-sector collaboration and for equipping physicians with practical levers—such as community-health workers, integrated outreach programmes, and dedicated funding streams—to address social determinants alongside clinical care.

Conclusion

This study found that pediatricians identified social and cultural factors, medical causes, healthcare system limitations, regional disparities, and implementation challenges as the primary contributors to high infant mortality rates in Turkey's Eastern and Southeastern Anatolia regions. Despite differences in emphasis, there was broad consensus that structural inequalities and access barriers play a critical

role in sustaining mortality rates. These findings are important because they highlight the need for targeted health policies, improved maternal and child healthcare services, and context-specific interventions that address both medical and socio-cultural determinants. By incorporating healthcare providers 'perspectives, the study offers evidence-based insights that can guide strategies to reduce infant mortality and promote equity in healthcare across Turkiye.

Recommendations

Based on the perspectives of pediatricians and the patterns identified in this study, several actionable recommendations emerge to reduce infant mortality and narrow regional disparities in Turkey's Eastern and Southeastern Anatolia:

Integrate Social Determinants into Health Policy

Addressing infant mortality requires more than medical care alone. A coordinated, whole-of-government strategy that links health, social services, education, and local administrations is essential to tackle underlying drivers such as poverty, maternal malnutrition, inadequate living conditions, and harmful cultural practices. This approach should pilot community-health worker models and mobile outreach teams that connect families with both clinical services and social support. Programmes that blend community-based health education, culturally sensitive counselling on consanguinity and early marriage, and expanded prenatal nutrition support with high-quality medical care can create a comprehensive safety net for mothers and infants.

Strengthen Preventive and Maternal–Child Health Services

Reducing infant mortality depends on ensuring that high-quality preventive and maternal–child care is accessible everywhere. Antenatal, perinatal, and postnatal care protocols should be expanded and standardised across all provinces, with particular focus on rural communities and areas with large refugee populations. Family physicians and primary-care teams must be given adequate time, staffing, and resources to deliver preventive services effectively. Priority should be placed on core quality bundles—clean delivery practices, neonatal resuscitation, early sepsis screening—and on reinforcing clear, rapid referral pathways from primary care to tertiary hospitals so that complications can be managed without delay.

Address Workforce Gaps and Enhance Retention

Move workforce policy from simple headcounts to retention and skill-mix. Prioritise the recruitment and long-term retention of paediatricians, neonatologists, perinatologists, obstetricians, midwives, and nurses in high-mortality regions. Provide financial incentives for rural posts, clear career pathways for neonatal specialists, continuous professional development, and mental-health support to

prevent burnout. Ensuring continuity of skilled staff is critical to sustaining improvements in care quality.

Enhance Data Quality and Monitoring

Improve the completeness and timeliness of infant and neonatal death reporting in vital registration systems, especially in refugee-dense provinces. Harmonise hospital, MERNİS, and national datasets to close registration gaps, and introduce multilingual outreach to ensure every birth and death is recorded. Conduct regular subnational audits and publicly report results to identify gaps, target interventions, and hold institutions accountable. Adjust staff-allocation formulas to reflect both resident and refugee populations so resources match actual birthloads.

Ensure Policy Implementation and Equity in Resource Allocation

Translate national-level goals into region-specific plans with measurable indicators. Allocate budgets, staff, and infrastructure according to real demand—including refugee populations—to prevent high-burden provinces from being under-resourced. Establish routine perinatal-death reviews and invest in local health-information systems that track quality indicators and health-worker distribution against actual caseloads. Strengthen oversight and coordination between national and provincial authorities to ensure policies are not only well designed but also effectively executed.

Together, these recommendations outline a dual strategy: building medical infrastructure and workforce capacity simultaneously tackling the socio-cultural determinants of infant mortality.Implementing them can accelerate progress toward equitable maternal and child health outcomes across Turkiye and sustain the gains achieved over the past two decades.

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