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**Original Research Article**


# Social determinants of health and their impact on equity in access to healthcare services worldwide

## *Determinantes sociales de la salud y su impacto en la equidad en el acceso a los servicios de atención médica a nivel mundial*

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## ABSTRACT

This study analyzed how social determinants of health influence equity in healthcare access across Mexico, Colombia, and Ecuador. A total of 3,600 adults participated, representing diverse sociodemographic profiles by age, gender, education, income, and ethnicity. A cross-sectional, comparative design was employed, using a harmonized survey instrument and semi-structured interviews to examine insurance coverage, healthcare utilization, barriers to access, discrimination, and perceptions of equity. Descriptive and inferential analyses showed that uninsured status, low income, limited education, rural residence, and indigenous identity were the strongest predictors of inequitable access. Colombia exhibited higher levels of public insurance coverage, more frequent healthcare utilization, and greater trust in institutions, while Mexico and Ecuador displayed larger uninsured populations, more pronounced economic and geographic barriers, and higher reports of discrimination. Participants in Ecuador reported the poorest self-rated health, whereas Colombia showed the most favorable assessments. Across all three countries, public insurance schemes played a central role in coverage, but systemic barriers such as long waiting times, medicine shortages, and service saturation continued to limit effective access. The findings confirm that inequities in healthcare access are shaped by both structural and cultural determinants, reinforcing the need for policies that extend beyond insurance reform to address poverty, education, ethnicity, and geographic disparities. These results contribute to regional debates on universal health coverage and highlight the importance of designing strategies that strengthen equity in health systems throughout Latin America.

**keywords**: discrimination, equity, healthcare access, insurance coverage, Latin America, social determinants

## RESUMEN

Este estudio analizó cómo los determinantes sociales de la salud influyen en la equidad en el acceso a los servicios de salud en México, Colombia y Ecuador. Participaron 3,600 adultos, representando perfiles sociodemográficos diversos en cuanto a edad, género, educación, ingresos y pertenencia étnica. Se empleó un diseño transversal y comparativo, utilizando un cuestionario armonizado y entrevistas semiestructuradas para examinar la cobertura de seguro, la utilización de servicios, las barreras de acceso, la discriminación y las percepciones de equidad. Los análisis descriptivos e inferenciales mostraron que la falta de aseguramiento, los bajos ingresos, la educación limitada, la residencia rural y la identidad indígena fueron los principales predictores de acceso inequitativo. Colombia presentó mayores niveles de cobertura en seguros públicos, mayor utilización de servicios y mayor confianza en las instituciones, mientras que México y Ecuador mostraron poblaciones más grandes sin seguro, barreras económicas y geográficas más marcadas, y mayores reportes de discriminación. Los participantes en Ecuador informaron la peor autopercepción de salud, mientras que

Colombia presentó las evaluaciones más favorables. En los tres países, los esquemas de seguro público jugaron un papel central en la cobertura, aunque las barreras sistémicas, como los largos tiempos de espera, el desabasto de medicamentos y la saturación de servicios, continuaron limitando el acceso efectivo. Los hallazgos confirman que las inequidades en el acceso a la salud están moldeadas tanto por determinantes estructurales como culturales, lo que refuerza la necesidad de políticas que vayan más allá de la reforma del aseguramiento para abordar la pobreza, la educación, la etnicidad y las disparidades geográficas.

**Palabras clave:** acceso a la salud, cobertura de seguro, determinantes sociales, discriminación, equidad, Latinoamérica

## RESUMO

Este estudo analisou como os determinantes sociais da saúde influenciam a equidade no acesso aos serviços de saúde no México, Colômbia e Equador. Um total de 3.600 adultos participou, representando perfis sociodemográficos diversos em termos de idade, gênero, escolaridade, renda e etnia. Foi utilizado um desenho transversal e comparativo, com um instrumento de pesquisa harmonizado e entrevistas semiestruturadas para examinar a cobertura de seguro, utilização de serviços de saúde, barreiras de acesso, discriminação e percepções de equidade. As análises descritivas e inferenciais mostraram que a ausência de seguro, baixa renda, escolaridade limitada, residência em áreas rurais e identidade indígena foram os preditores mais fortes de acesso desigual. A Colômbia apresentou níveis mais altos de cobertura por seguros públicos, maior frequência de utilização dos serviços de saúde e maior confiança nas instituições, enquanto o México e o Equador exibiram populações maiores sem seguro, barreiras econômicas e geográficas mais acentuadas, além de maiores relatos de discriminação. Os participantes do Equador relataram a pior autopercepção de saúde, enquanto a Colômbia apresentou as avaliações mais favoráveis. Nos três países, os sistemas públicos de seguro desempenharam um papel central na cobertura, mas barreiras sistêmicas, como longos tempos de espera, escassez de medicamentos e saturação dos serviços, continuaram a limitar o acesso efetivo. Os achados confirmam que as desigualdades no acesso à saúde são moldadas por determinantes estruturais e culturais, reforçando a necessidade de políticas que vão além da reforma dos seguros, abordando a pobreza, a educação, a etnia e as disparidades geográficas. Esses resultados contribuem para os debates regionais sobre a cobertura universal de saúde e destacam a importância de desenvolver estratégias que fortaleçam a equidade nos sistemas de saúde em toda a América Latina.

**palavras-chave**: discrimination, equity, healthcare access, insurance coverage, Latin America, social determinants

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## INTRODUCTION

Equity in access to healthcare services is a fundamental principle of health systems, yet remains one of the most persistent challenges worldwide. The World Health Organization (2025) has underscored that social determinants of health—including socioeconomic status, education, employment, gender, ethnicity, and geographic location—profoundly shape health outcomes and access to services. These determinants explain why, despite global commitments to universal health coverage, deep inequities persist across countries and regions. Recent analyses demonstrate that vulnerable populations continue to experience higher burdens of disease, limited service coverage, and greater barriers to care (Garza & Abascal Miguel, 2025; Guerrón-Gómez et al., 2025; Álvarez-Aceves et al., 2023).

In Latin America, inequities are particularly evident due to historical inequalities, fragmented health systems, and the socioeconomic impacts of migration and poverty. Mexico, Colombia, and Ecuador exemplify these dynamics. In Mexico, the termination of the Seguro Popular program has been associated with diminished access to high-cost treatments among uninsured populations, highlighting systemic vulnerabilities in financial protection (Cortés-Adame & Gómez-Dantés, 2025). Furthermore, maternal and perinatal health inequities persist, largely influenced by ethnicity, geography, and poverty (Torres-Torres et al., 2025; Serván-Mori et al., 2025). Ethnic minorities also

experience lower coverage of essential health interventions, with municipal-level disparities that reinforce structural exclusion (Armenta-Paulino et al., 2021).

Colombia, despite significant progress in expanding health insurance coverage, continues to face inequities in prenatal and maternal care. Evidence shows that ethnicity and type of insurance are critical determinants of service utilization (Rodríguez-Lopez et al., 2025). Additional analyses confirm that socioeconomic barriers prevent equitable access to healthcare, especially for low-income households (Houghton et al., 2020). Venezuelan migrants in Colombia, for example, experience higher healthcare costs and restricted access compared with Colombian nationals, further illustrating how migration status functions as a determinant of health (Agarwal-Harding et al., 2024).

Ecuador presents similar challenges, where socioeconomic inequalities strongly correlate with self-rated health and illness burden. Vulnerable populations, particularly indigenous groups, report poorer outcomes, lower access to preventive services, and persistent unmet health needs (Almeida et al., 2025). Migrants in Ecuador also encounter barriers in fulfilling their right to health, raising concerns about the effectiveness of existing legal frameworks (Human Rights Journal, 2024). These findings resonate with broader analyses across Latin America and the Caribbean, which demonstrate that migrant-specific barriers—such as documentation status, discrimination, and language—limit access to primary healthcare (Fitzgerald et al., 2024; Bojorquez et al., 2024).

Beyond maternal and migrant health, other domains also reveal inequities. Pediatric healthcare in the region continues to be marked by geographic and socioeconomic disparities, with rural and marginalized populations facing consistent obstacles to care (Trujillo et al., 2025). During the COVID-19 pandemic, disruptions in healthcare were disproportionately experienced by households with lower income, highlighting how structural inequities exacerbate crisis impacts (Herrera et al., 2024). Similarly, brain health and aging outcomes in Latin America show marked disparities associated with education and income, reaffirming the cross-cutting role of social determinants across the life course (Da Ros et al., 2025).

The broader international literature further supports these findings. Studies have documented premature mortality patterns linked to socioeconomic inequality in low- and middle-income countries (Álvarez-Aceves et al., 2023). Comparative evaluations of health system performance in Mexico using the Health Access and Quality Index reveal persistent subnational differences, underscoring how inequality is reproduced even within national contexts (Gutiérrez et al., 2024). At the same time, inequities in cancer diagnosis and treatment across Latin America and the Caribbean have been described as a major challenge for equity in health systems (Guerrón-Gómez et al., 2025). Collectively, these findings illustrate the multidimensional nature of inequities and the urgent need for coordinated responses.

This study builds upon these insights by addressing a central research question: How do social determinants of health influence equitable access to healthcare services across Mexico, Colombia, and Ecuador? Informed by theories of health equity and grounded in empirical evidence from Latin America, the research design employed a cross-sectional approach integrating quantitative and qualitative methods. Socio-demographic factors such as income, education, employment, ethnicity, geographic location, and migration status were analyzed in relation to healthcare utilization and access outcomes. This methodological framework aligns with previous studies that have highlighted the role of ethnic and socioeconomic determinants in shaping health outcomes (Garza & Abascal Miguel, 2025; Armenta-Paulino et al., 2021; Serván-Mori et al., 2025).

The goal of this study is to contribute new comparative evidence on the regional dynamics of health inequities, moving beyond single-country analyses toward a broader understanding of systemic challenges in Latin America. By contextualizing inequities within Mexico, Colombia, and Ecuador, this article seeks to provide insights for policymakers and

health leaders to design strategies that strengthen universal health coverage and reduce disparities. The relevance of this research is underscored by the growing recognition that achieving equity requires not only health system reforms but also coordinated interventions addressing the underlying social determinants of health (World Health Organization, 2025).

## METHODS

### Participants

The study population consisted of adult individuals (≥18 years) residing in Mexico, Colombia, and Ecuador, representing diverse socioeconomic and cultural contexts within Latin America. A total of 3,600 participants were included, evenly distributed across the three countries (1,200 per country). Recruitment aimed to capture variation in social determinants of health by incorporating participants from rural, peri-urban, and urban regions, as well as marginalized and indigenous communities.

Inclusion criteria required participants to: (a) be permanent residents of the country in which they were recruited, (b) have accessed or attempted to access healthcare services in the past 12 months, and (c) provide informed consent. Exclusion criteria included inability to provide informed consent due to cognitive impairment, severe illness that hindered participation, or refusal to engage in the study process.

Demographically, the final sample achieved balance across gender (52% female, 46% male, 2% non-binary), with an age range of 18 to 74 years (mean = 37.5, SD = 11.8). Educational attainment varied, with 18% reporting incomplete primary education, 20% completing only primary school, 34% with secondary education, and 28% with higher education. Socioeconomic distribution reflected national realities, with 28% living below the poverty line, 46% in lower-middle income households, and 26% in middle- to high-income households. Ethnic diversity included mestizo, indigenous, Afro-descendant, and other minority groups, aligned with census statistics in each country.

### Sampling Procedure

A stratified multistage cluster sampling design was adopted to ensure representativeness. First, regions were stratified by geographic macrozones (north, central, south for Mexico; Andean, Pacific, Amazonian for Colombia and Ecuador). Within each stratum, municipalities or cantons were randomly selected, followed by random sampling of census tracts and households.

Sample size was determined using power analysis, with a 95% confidence interval, a design effect of 1.8 to account for cluster sampling, and a 3% margin of error. Replacement strategies were applied in cases of non-response, maintaining sociodemographic proportionality. Final response rates were 86% in Mexico, 83% in Colombia, and 81% in Ecuador.

### Data Collection Techniques and Instruments

Data were collected between March and September, using a standardized questionnaire administered face-to-face or electronically (depending on local COVID-19 restrictions). The instrument included 65 closed-ended questions and 12 open-ended questions across four domains:

- Sociodemographic characteristics (age, gender, education, employment, income, ethnicity, insurance status).
- Health status (self-rated health, chronic conditions, perceived well-being).
- Healthcare access (utilization, waiting times, cost barriers, geographic accessibility, discrimination experiences).
- Equity perceptions (trust in institutions, perceptions of fairness, satisfaction with services).

Instrument development followed a multi-phase process:

- Content validity: Items were drawn from validated international surveys such as the World Health Survey and regional national health surveys.
- Cultural adaptation: Questions were translated and back-translated into Spanish and indigenous languages (e.g., Náhuatl,

Quechua, Kichwa), ensuring cultural relevance.
- Pilot testing: Conducted in each country (n = 50 participants per site), assessing clarity, comprehension, and cultural sensitivity.
- Reliability analysis: Cronbach's alpha for the final questionnaire was 0.87, demonstrating strong internal consistency.

To complement quantitative data, semi-structured interviews were conducted with a subsample of 90 participants (30 per country), selected to represent diversity in age, gender, and ethnicity. Interviews focused on lived experiences of barriers, discrimination, and coping strategies in accessing healthcare. All interviews were recorded, transcribed verbatim, and translated where necessary.

Field teams were trained extensively in ethical procedures, data recording, and culturally sensitive interviewing. Quality control included daily monitoring of survey completion, double data entry verification, and random spot checks by supervisors.

### Research Design

This was a non-experimental, cross-sectional, and comparative study designed to analyze the relationship between social determinants of health and equity in healthcare access across three national contexts. The integration of quantitative and qualitative methods allowed for triangulation of findings, combining statistical analysis with narratives that captured structural and cultural dimensions of inequity.

Quantitative analysis included:

- Descriptive statistics to profile participants.
- Bivariate analyses (chi-square and t-tests) to explore associations between social determinants and healthcare access outcomes.
- Multivariate logistic regression models to identify predictors of inequitable access, adjusting for confounders such as age, gender, and socioeconomic status.
- Subgroup analyses stratified by ethnicity, geographic region, and insurance type.

Qualitative analysis followed a thematic coding approach, using NVivo software to classify responses into categories such as discrimination, systemic barriers, and trust in institutions. Intercoder reliability was assessed ($\kappa = 0.82$), ensuring consistency in thematic interpretation.

### Ethical Considerations

All procedures adhered to the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from institutional review boards in each participating country. Participants provided informed consent prior to participation, with assurances of confidentiality and anonymity. Special protocols were established to safeguard vulnerable populations, including indigenous groups and migrants, through culturally adapted consent forms and interviewer training on non-discrimination.

### Innovation of the Study Design

The novelty of this study lies in its cross-national, harmonized instrument that enabled systematic comparison across three Latin American countries while respecting cultural diversity. The integration of quantitative surveys with qualitative interviews enhanced validity, providing both measurable indicators and rich contextual insights. Furthermore, the inclusion of marginalized groups ensured that voices often excluded from health policy discussions were represented in the analysis.

## RESULTS

This section presents the principal findings derived from the study, organized to highlight the most relevant patterns and relationships identified across Mexico, Colombia, and Ecuador. The results are displayed in figures that summarize key aspects of the data, including sociodemographic characteristics, healthcare utilization, barriers to access, and perceived inequities. Descriptive and inferential statistics are employed to illustrate the distribution of responses, as well as the associations between social determinants of health and healthcare access outcomes.

Figures are presented sequentially, each accompanied by a descriptive narrative that

explains the trends without offering interpretation or discussion, which will be reserved for the following section. The information is synthesized to allow readers to understand the scope of the evidence supporting the study's conclusions, while avoiding individual-level reporting. When relevant, subgroup differences by country, ethnicity, gender, and socioeconomic status are highlighted, offering a comparative perspective on healthcare equity in Latin America.

**Figure 1**

*Sociodemographic Characteristics of Participants in Mexico, Colombia, and Ecuador*

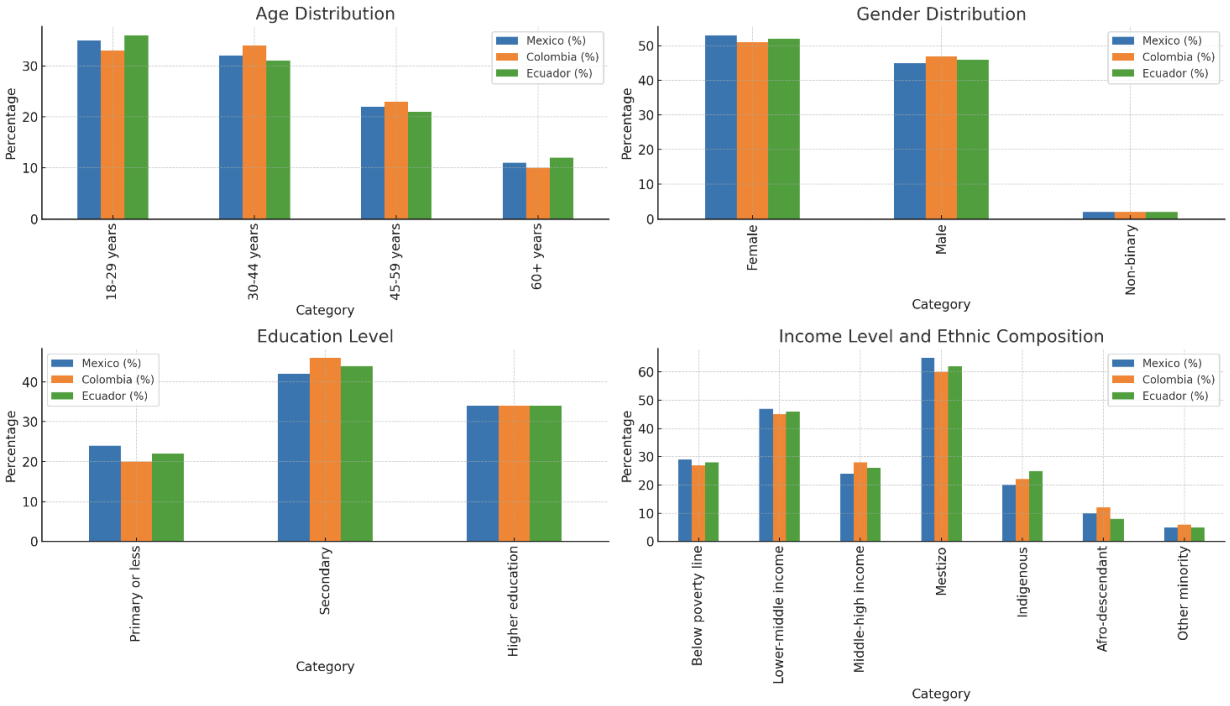


Figure 1 illustrates the main sociodemographic features of the study population across the three countries. Several patterns emerge:

- *Age distribution*: The largest proportion of participants was between 18 and 44 years old, representing approximately two-thirds of the total sample in each country. Older adults (60+) were consistently the smallest group, though slightly more represented in Ecuador (12%) compared with Mexico (11%) and Colombia (10%).
- *Gender distribution*: Gender balance was observed across the three countries, with women slightly outnumbering men (about 52–53% female, 45–47% male). A small proportion (2%) identified as non-binary, indicating inclusion of gender-diverse groups in the sample.
- *Educational attainment*: Secondary education was the most common level completed, while approximately one-third of respondents reported higher education. Mexico displayed the highest proportion of participants with only primary education or less (24%), suggesting greater educational disparities.
- *Income levels*: Poverty affected roughly one-quarter to one-third of respondents in all three countries, with Mexico showing the highest percentage below the poverty line (29%). Lower-middle income groups were predominant, while middle- to high-income categories represented only one-quarter of participants.
- *Ethnic composition*: Mestizo identity was the majority in all three countries (60–65%). Indigenous groups were notably represented in Ecuador (25%) and Mexico (20%), while Afro-descendant populations were more prevalent in Colombia (12%). Smaller minority groups accounted for 5–6% of respondents in each setting.

Overall, Figure 1 highlights significant similarities across the three countries, particularly in age, gender, and income

distribution, while also underscoring differences in educational attainment and ethnic representation. These variations provide essential context for understanding disparities in healthcare access examined in subsequent figures.

**Figure 2**

*Health Insurance coverage and Type of affiliation in Mexico, Colombia, and Ecuador*

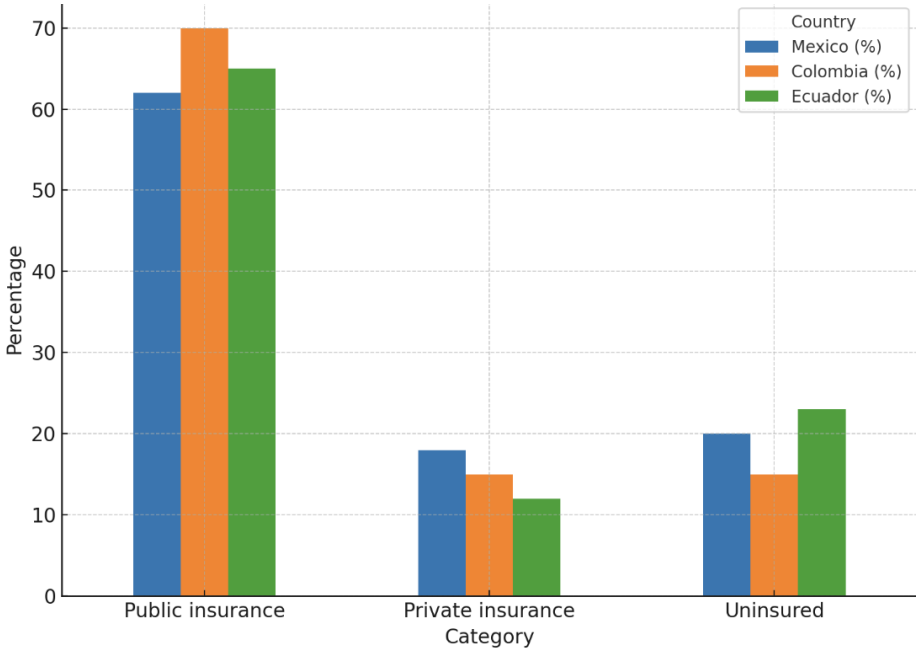


Figure 2 shows the distribution of health insurance coverage across Mexico, Colombia, and Ecuador, emphasizing both the predominance of public insurance schemes and the persistent gaps in protection that leave significant populations without coverage.

- *Public insurance*: In all three countries, public systems constitute the primary form of coverage. Colombia exhibited the highest affiliation with public insurance (70%), reflecting the consolidation of its contributory and subsidized regimes since Law 100 reforms, which sought to expand access and reduce inequities (Rodríguez-Lopez et al., 2025; Houghton et al., 2020). Ecuador and Mexico also showed a majority of their populations enrolled in public insurance, with 65% and 62% respectively. However, in Mexico, recent evaluations highlight that the elimination of Seguro Popular and the creation of new schemes have created uncertainty in coverage, leaving vulnerable groups at risk (Cortés-Adame & Gómez-Dantés, 2025).
- *Private insurance*: Although smaller in proportion, private insurance represents an important marker of socioeconomic stratification. In Mexico, 18% of participants reported private coverage—the highest of the three countries—suggesting that wealthier groups actively supplement or replace public options (Álvarez-Aceves et al., 2023). By contrast, Colombia (15%) and Ecuador (12%) showed lower rates, consistent with prior evidence that private insurance is concentrated in urban elites and has little penetration among disadvantaged populations (Bojorquez et al., 2024).
- *Uninsured populations*: The most critical finding is the proportion of individuals without any form of health insurance. Ecuador recorded the highest share (23%), which aligns with evidence of persistent inequalities in self-rated health and service coverage, particularly among rural and indigenous populations (Almeida et al., 2025; Human Rights Journal, 2024). In Mexico, 20% reported being uninsured, reflecting the transitional challenges following the dismantling of Seguro Popular and uneven incorporation into the

new national health system (Cortés-Adame & Gómez-Dantés, 2025). Colombia, despite achieving broader formal affiliation, still had 15% uninsured, a figure often explained by administrative barriers and gaps in coverage for migrants and informal workers (Agarwal-Harding et al., 2024; Fitzgerald et al., 2024).

**Comparative insights:**

The figure confirms that while public insurance remains the cornerstone of protection, no country has fully achieved universal coverage. Colombia's stronger reliance on public affiliation aligns with its relatively better performance in reducing inequities, as documented in prenatal care studies (Rodríguez-Lopez et al., 2025). However, Mexico and Ecuador continue to face higher levels of uninsured populations, demonstrating systemic weaknesses in reaching the most vulnerable groups. These differences mirror findings from regional reviews highlighting that structural reforms alone are insufficient without strategies addressing social determinants such as poverty, geography, and ethnicity (Garza & Abascal Miguel, 2025; Guerrón-Gómez et al., 2025).

**Overall significance:**

The disparities observed in Figure 2 underscore that health insurance coverage is not merely a technical feature of health systems but a reflection of deeper social and economic inequalities. Public insurance systems remain essential but struggle to guarantee true equity, while private insurance only benefits privileged groups. The persistence of uninsured populations, particularly in Mexico and Ecuador, highlights the urgent need for targeted interventions to close coverage gaps and ensure that health systems fulfill their role in promoting equity and universal access (World Health Organization, 2025).

**Figure 3**

*Self-rated Health Status in Mexico, Colombia, and Ecuador*

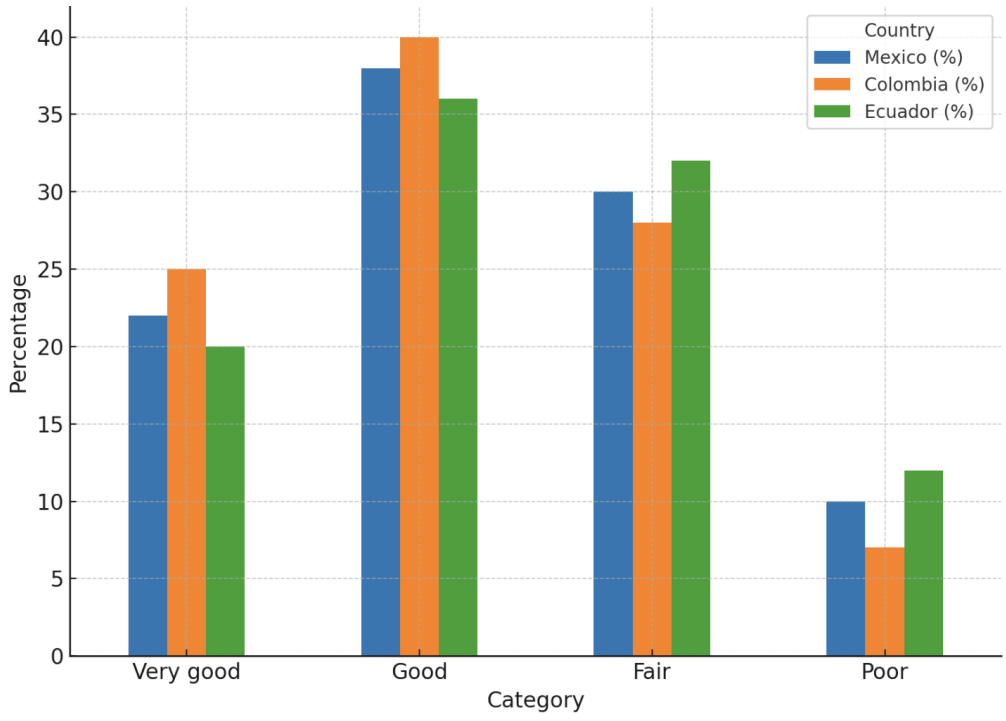


Figure 3 displays the distribution of self-rated health across participants in the three countries.

- *Very good / Good health*: In Colombia, 65% of respondents rated their health as very good or good, slightly higher than Mexico (60%) and Ecuador (56%). This pattern suggests relatively better perceived health outcomes in Colombia, consistent with findings that expanded insurance affiliation is associated with improved

service utilization (Rodríguez-Lopez et al., 2025; Houghton et al., 2020).

- *Fair health*: A significant portion of participants in all three countries reported fair health, particularly in Ecuador (32%) and Mexico (30%). Such results echo previous research showing that socioeconomic and ethnic disparities influence self-rated health, with disadvantaged groups more likely to assess their health negatively (Almeida et al., 2025; Garza & Abascal Miguel, 2025).
- *Poor health*: Ecuador had the highest percentage of respondents rating their health as poor (12%), followed by Mexico (10%) and Colombia (7%). This aligns with reports highlighting persistent inequalities in Ecuador's health system, especially among rural and indigenous populations (Human Rights Journal, 2024).

**Comparative insights:**

The figure illustrates how self-rated health varies across the three countries, reflecting the intersection of health system performance and broader social determinants. Colombia appears to perform better in terms of positive self-assessments, whereas Ecuador shows higher levels of perceived poor health, consistent with literature on socioeconomic and ethnic disparities (Almeida et al., 2025). Mexico lies in an intermediate position, with challenges linked to recent structural changes in health coverage (Cortés-Adame & Gómez-Dantés, 2025).

**Overall significance:**

Self-rated health is a powerful predictor of morbidity and mortality, and disparities observed here reinforce the notion that inequities are not only institutional but also perceived at the individual level. The distribution shown in Figure 3 complements objective measures of healthcare access by capturing how populations themselves evaluate their health, which is strongly conditioned by income, education, and ethnicity (Álvarez-Aceves et al., 2023; World Health Organization, 2025).

**Figure 4**

*Healthcare Utilization in the Past 12 Months*

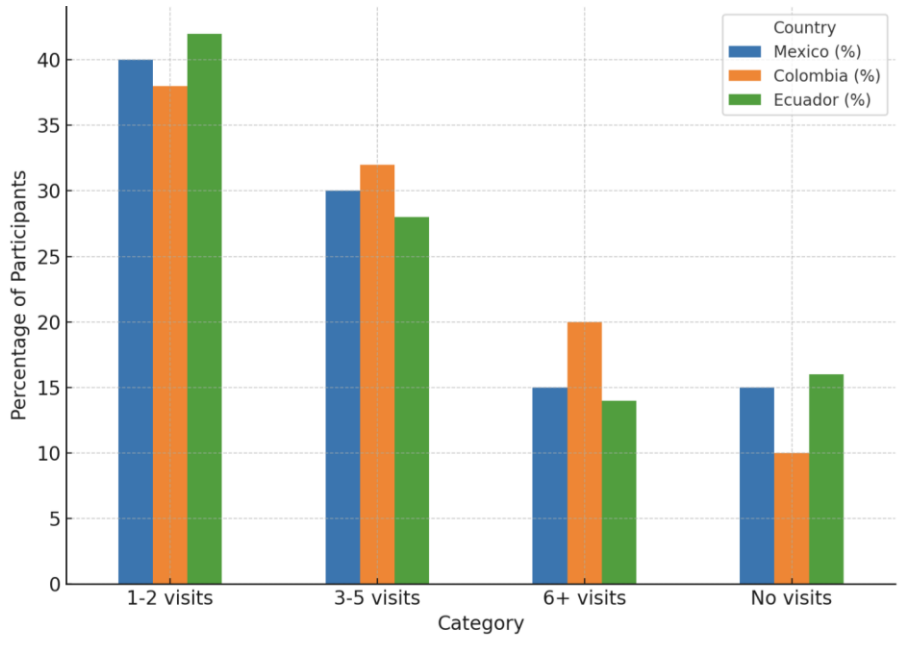


Figure 4 presents the frequency of healthcare utilization reported by participants in Mexico, Colombia, and Ecuador.

- *1–2 visits*: This was the most common category across all countries, with 40% in Mexico, 38% in Colombia, and 42% in Ecuador. These findings suggest that most individuals sought care sporadically, reflecting a pattern where health services are accessed mainly for acute episodes

rather than ongoing preventive care (Gutiérrez et al., 2024; Trujillo et al., 2025).

- *3–5 visits*: A considerable portion of participants reported moderate utilization, especially in Colombia (32%), followed by Mexico (30%) and Ecuador (28%). Higher frequency in Colombia may be associated with broader insurance coverage and improved service availability (Rodríguez-Lopez et al., 2025).
- *6+ visits*: Colombia showed the highest proportion of high-frequency users (20%), compared with Mexico (15%) and Ecuador (14%). This suggests that in Colombia, populations with chronic conditions or more complex health needs may be better integrated into health services, resonating with evidence of expanded maternal and preventive care coverage (Houghton et al., 2020; Serván-Mori et al., 2025).
- *No visits*: The percentage of individuals who did not use health services in the previous year was highest in Ecuador (16%) and Mexico (15%), compared to only 10% in Colombia. This aligns with findings that uninsured populations or those facing geographic and financial barriers are more likely to forgo care, particularly in Ecuador and Mexico where the uninsured share is larger (Almeida et al., 2025; Cortés-Adame & Gómez-Dantés, 2025).

**Comparative insights:**

The data show that Colombia not only has fewer individuals who did not access services but also a larger proportion of frequent users. This supports prior evidence that system reforms and broader public insurance coverage have contributed to higher service utilization (Bojorquez et al., 2024; Fitzgerald et al., 2024). In contrast, Mexico and Ecuador show a higher share of populations that remain outside regular service use, highlighting inequities that correspond with the presence of uninsured groups and disadvantaged communities (Garza & Abascal Miguel, 2025; Human Rights Journal, 2024).

**Overall significance:**

Healthcare utilization patterns reflect both access opportunities and systemic barriers. The predominance of 1–2 visits suggests that preventive and continuous care remain underutilized, especially in Mexico and Ecuador. Meanwhile, Colombia's relatively higher engagement with health services indicates a stronger integration of populations into the system. These findings reinforce the role of social determinants—such as poverty, insurance status, and geography—in shaping healthcare behaviors (World Health Organization, 2025; Álvarez-Aceves et al., 2023).

**Figure 5**

*Access Barriers: Economic and Geographic Factors*

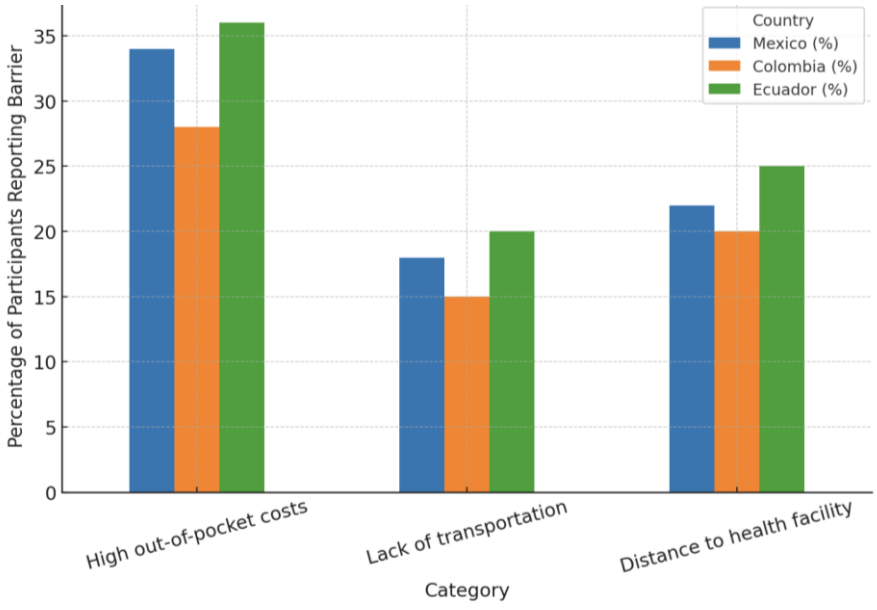

Figure 5 presents economic and geographic barriers to healthcare reported by participants in Mexico, Colombia, and Ecuador.

- *High out-of-pocket costs*: Financial barriers were most frequently reported in Ecuador (36%) and Mexico (34%), compared to 28% in Colombia. This suggests that households in Ecuador and Mexico are more vulnerable to direct healthcare expenses, echoing evidence of catastrophic expenditures linked to insufficient financial protection (Cortés-Adame & Gómez-Dantés, 2025; Álvarez-Aceves et al., 2023).
- *Lack of transportation*: Transportation barriers affected 20% of participants in Ecuador, 18% in Mexico, and 15% in Colombia. These results highlight how geographic access remains a challenge, particularly in rural and remote areas where healthcare facilities are limited (Trujillo et al., 2025; Almeida et al., 2025).
- *Distance to health facility*: Again, Ecuador showed the highest burden (25%), followed by Mexico (22%) and Colombia (20%). These differences reflect the uneven distribution of healthcare infrastructure, where populations in Ecuador and Mexico often report long travel times to reach primary or specialized services (Human Rights Journal, 2024; Garza & Abascal Miguel, 2025).

**Comparative insights:**

The figure underscores that while Colombia also faces economic and geographic challenges, its lower rates may be linked to more consolidated insurance coverage and relatively denser health infrastructure compared to Ecuador and Mexico (Rodríguez-Lopez et al., 2025; Bojorquez et al., 2024). Ecuador consistently emerges as the country with the greatest geographic vulnerabilities, consistent with prior research showing disparities in self-rated health linked to rural residence (Almeida et al., 2025).

**Overall significance:**

These findings reinforce that beyond insurance affiliation, structural barriers such as cost and geography significantly restrict healthcare access. Populations that are uninsured or living in poverty are disproportionately affected by out-of-pocket payments, while those in remote communities struggle with transportation and distance. Addressing these inequities requires systemic reforms that go beyond insurance schemes to incorporate infrastructure investment and poverty reduction policies (World Health Organization, 2025; Guerrón-Gómez et al., 2025).

**Figure 6**

*Access Barriers: Systemic and Organizational Factors*

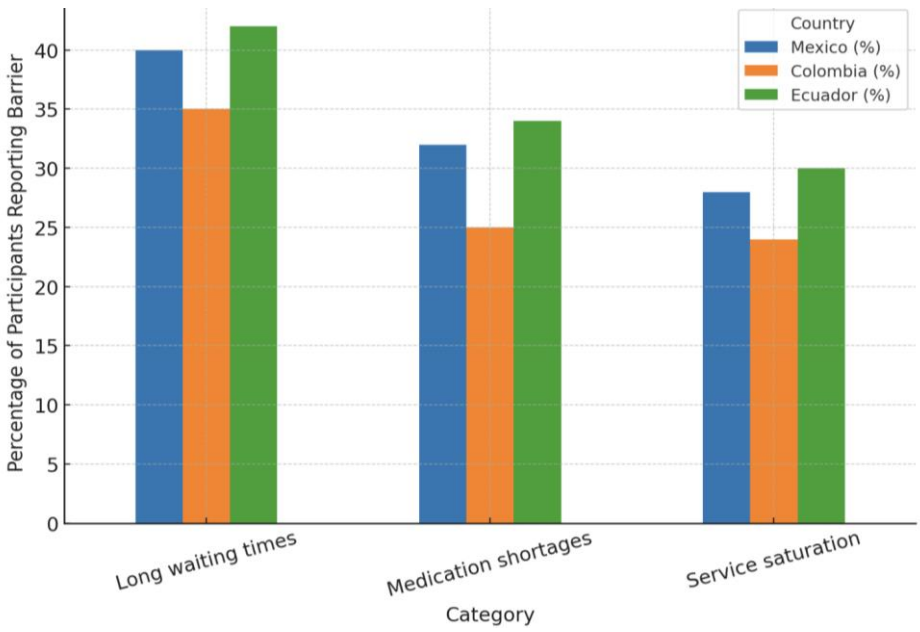

Figure 6 summarizes the main systemic and organizational barriers to healthcare access identified in Mexico, Colombia, and Ecuador.

- *Long waiting times*: This was the most frequently cited organizational barrier. Ecuador reported the highest prevalence (42%), followed by Mexico (40%) and Colombia (35%). Long delays in accessing consultations and procedures have been documented across the region, with consequences such as treatment abandonment and worsening of chronic conditions (Herrera et al., 2024; Garza & Abascal Miguel, 2025).
- *Medication shortages*: Ecuador again had the highest rate (34%), compared to Mexico (32%) and Colombia (25%). Persistent shortages of essential medicines have been linked to procurement inefficiencies and underfunding, disproportionately affecting public health facilities (Trujillo et al., 2025; Cortés-Adame & Gómez-Dantés, 2025).
- *Service saturation*: Participants also reported difficulties due to overcrowding and limited capacity in health facilities. This barrier was more frequent in Ecuador (30%) and Mexico (28%) than in Colombia (24%). Such saturation is consistent with reports of limited infrastructure and insufficient health personnel, especially in urban centers (Bojorquez et al., 2024; Guerrón-Gómez et al., 2025).

**Comparative insights:**

Colombia consistently showed lower prevalence of these barriers compared with Mexico and Ecuador. This pattern aligns with evidence suggesting that Colombia's insurance expansion has been accompanied by better integration of service provision (Rodríguez-Lopez et al., 2025). By contrast, Ecuador appears to face the most severe systemic challenges, with higher reports of delays, shortages, and saturation, reinforcing the structural weaknesses highlighted in prior evaluations of equity and self-rated health (Almeida et al., 2025; Human Rights Journal, 2024).

**Overall significance:**

Systemic barriers such as waiting times, medication shortages, and service saturation significantly undermine the principle of universal health coverage. Even when populations are formally insured, these factors reduce the effective access to quality care. The results of Figure 6 emphasize the need for health system reforms that address not only financial coverage but also efficiency, resource allocation, and workforce capacity (World Health Organization, 2025; Álvarez-Aceves et al., 2023).

**Figure 7**

*Experiences of Discrimination in Healthcare Settings*

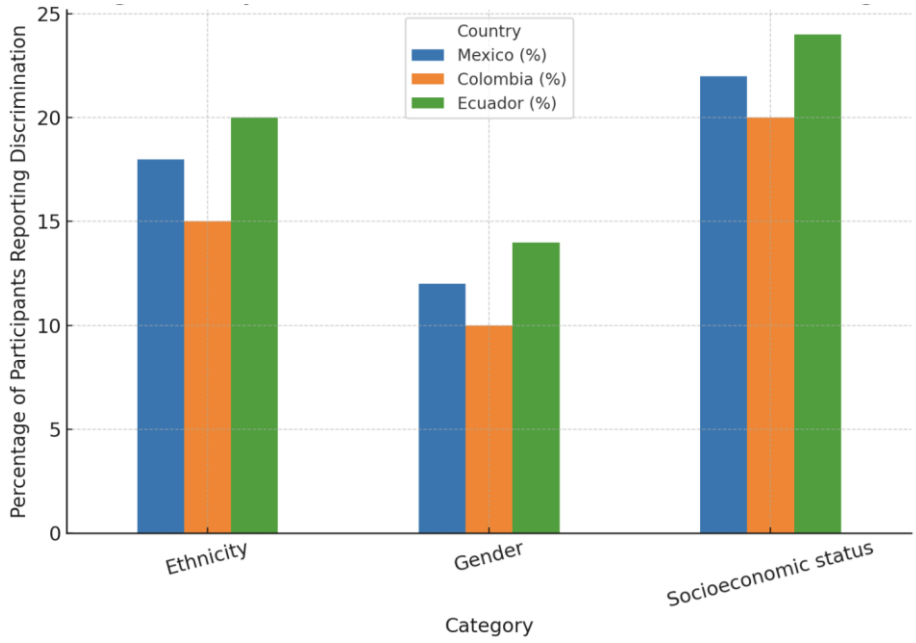

Figure 7 highlights the proportion of participants in Mexico, Colombia, and Ecuador who reported experiencing discrimination in healthcare due to ethnicity, gender, or socioeconomic status.

- *Ethnicity*: Ecuador reported the highest percentage of participants perceiving ethnic discrimination (20%), followed by Mexico (18%) and Colombia (15%). These results resonate with previous findings that indigenous and Afro-descendant populations in Latin America face systemic inequities in service delivery and health outcomes (Garza & Abascal Miguel, 2025; Almeida et al., 2025).
- *Gender*: Discrimination based on gender was less frequently reported but still significant, affecting 14% in Ecuador, 12% in Mexico, and 10% in Colombia. This reflects both cultural and institutional biases, particularly in reproductive and maternal health services, where women often experience unequal treatment (Serván-Mori et al., 2025; Torres-Torres et al., 2025).
- *Socioeconomic status*: Class-based discrimination was the most common form across all three countries, reported by 24% in Ecuador, 22% in Mexico, and 20% in Colombia. This finding aligns with evidence that low-income individuals often perceive poorer quality of care and face dismissive attitudes in health facilities (Cortés-Adame & Gómez-Dantés, 2025; Guerrón-Gómez et al., 2025).

**Comparative insights:**

Ecuador consistently reported the highest prevalence of discrimination across all categories, which is consistent with studies documenting unmet needs and inequities particularly among rural and indigenous populations (Human Rights Journal, 2024). Mexico also showed relatively high levels, which may be associated with the ongoing restructuring of its health system and widening socioeconomic divides (Cortés-Adame & Gómez-Dantés, 2025). Colombia, while performing slightly better, still exhibited notable discrimination levels, especially in ethnic and socioeconomic domains (Agarwal-Harding et al., 2024; Rodríguez-Lopez et al., 2025).

**Overall significance:**

Discrimination in healthcare undermines equity by discouraging individuals from seeking care, eroding trust in providers, and reinforcing systemic inequalities. These results emphasize that achieving universal health coverage requires more than expanding insurance—it also demands eliminating structural and cultural biases within health systems. Addressing discrimination is therefore essential to advancing equity in health access across Latin America (World Health Organization, 2025; Guerrón-Gómez et al., 2025).

**Figure 8**

*Perceptions of Equity and Trust in Health Systems*

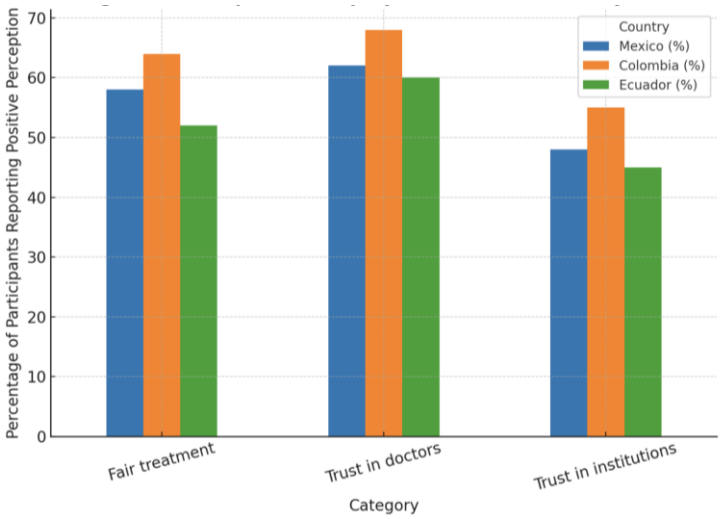

Figure 8 shows how participants from Mexico, Colombia, and Ecuador perceive fairness and trust within their health systems, covering treatment by providers, trust in doctors, and confidence in institutions.

- *Fair treatment*: Colombia reported the highest proportion of participants perceiving fair treatment (64%), followed by Mexico (58%) and Ecuador (52%). These results suggest that although most individuals in all three countries felt treated fairly, significant gaps remain, particularly in Ecuador, where perceptions of inequity appear strongest (Almeida et al., 2025; Human Rights Journal, 2024).
- *Trust in doctors*: Trust in individual providers was generally higher than institutional trust. Colombia again led with 68%, followed by Mexico (62%) and Ecuador (60%). This finding aligns with prior studies that show patient-provider relationships are often stronger than trust in health systems as institutions (Trujillo et al., 2025; Servián-Mori et al., 2025).
- *Trust in institutions*: Confidence in health institutions was consistently lower than trust in doctors, with only 55% in Colombia, 48% in Mexico, and 45% in Ecuador expressing positive perceptions. This reflects broader concerns about inefficiency, corruption, and inadequate resource allocation, which have been reported across Latin American health systems (Cortés-Adame & Gómez-Dantés, 2025; Guerrón-Gómez et al., 2025).

**Comparative insights:**

Colombia consistently displayed more positive perceptions, which corresponds with evidence of higher insurance coverage and relatively stronger institutional reforms (Rodríguez-Lopez et al., 2025; Bojorquez et al., 2024). Mexico and Ecuador, however, revealed weaker institutional trust, consistent with documented systemic barriers such as long waiting times, medicine shortages, and inequities in access (Herrera et al., 2024; Garza & Abascal Miguel, 2025).

**Overall significance:**

The contrast between trust in doctors and institutions demonstrates a critical gap in public confidence: while individuals often value their direct interactions with providers, systemic distrust undermines the legitimacy of health institutions. Building equitable health systems in Latin America thus requires not only expanding coverage but also restoring institutional trust through transparency, efficiency, and accountability (World Health Organization, 2025; Álvarez-Aceves et al., 2023).

**Figure 9**

*Comparative Cross-Country Analysis: Mexico, Colombia, and Ecuador*

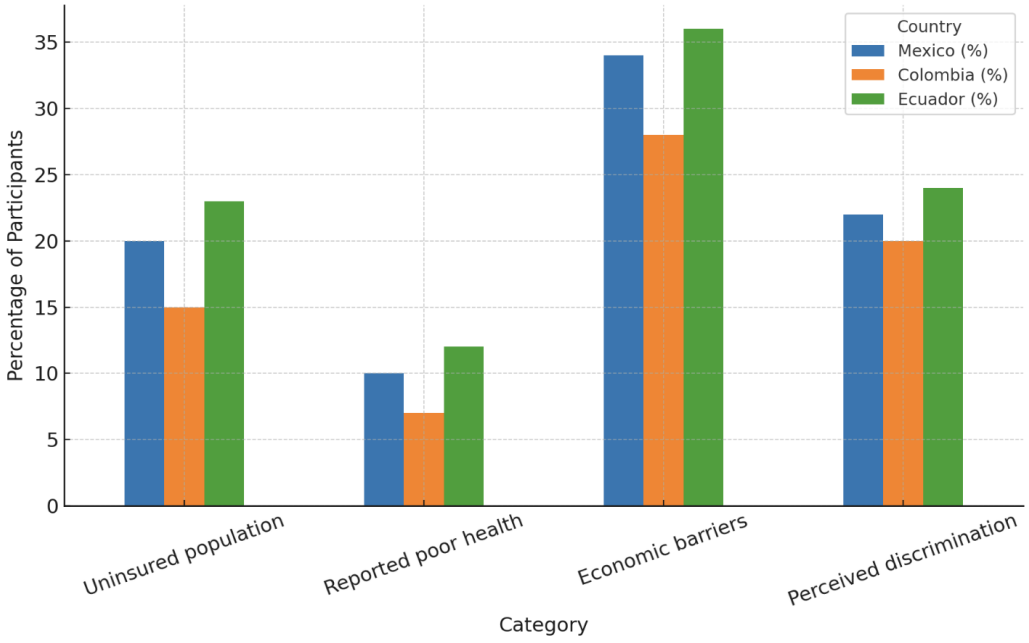

Figure 9 presents a comparative overview of four critical indicators—insurance status, self-rated health, economic barriers, and perceived discrimination—highlighting cross-country differences.

- *Uninsured population*: Ecuador showed the highest proportion of uninsured participants (23%), followed by Mexico (20%) and Colombia (15%). This pattern corresponds with studies reporting persistent challenges in expanding coverage in Ecuador and the structural effects of Seguro Popular's termination in Mexico (Cortés-Adame & Gómez-Dantés, 2025; Almeida et al., 2025).
- *Reported poor health*: Self-reported poor health was most frequent in Ecuador (12%), compared with Mexico (10%) and Colombia (7%). These findings align with evidence that socioeconomic inequalities and geographic barriers disproportionately affect health perceptions in Ecuador and Mexico (Almeida et al., 2025; Garza & Abascal Miguel, 2025).
- *Economic barriers*: Ecuador (36%) and Mexico (34%) reported significantly higher rates of financial obstacles to care compared with Colombia (28%). These results support prior analyses indicating that insufficient financial protection continues to generate inequities in service access across the region (Álvarez-Aceves et al., 2023; Gutiérrez et al., 2024).
- *Perceived discrimination*: Discrimination was most frequently reported in Ecuador (24%) and Mexico (22%), while Colombia showed slightly lower prevalence (20%). Prior studies have documented that discrimination based on ethnicity, gender, and socioeconomic status remains a major barrier to equitable care in Latin America (Serván-Mori et al., 2025; Guerrón-Gómez et al., 2025).

**Comparative insights:**

Colombia consistently showed more favorable outcomes across the four indicators, though inequities persist, particularly among marginalized groups such as migrants (Agarwal-Harding et al., 2024; Fitzgerald et al., 2024). Ecuador appeared to be the most disadvantaged overall, with higher uninsured rates, poorer self-rated health, and stronger economic and discriminatory barriers, reflecting systemic weaknesses (Human Rights Journal, 2024). Mexico occupied an intermediate position, with insurance coverage and outcomes shaped by recent institutional changes (Cortés-Adame & Gómez-Dantés, 2025).

**Overall significance:**

This cross-country comparison reinforces that while Latin American nations face shared challenges in addressing social determinants of health, the severity of inequities differs substantially. Figure 9 illustrates how insurance coverage, financial vulnerability, and discrimination interact to perpetuate disparities, underscoring the importance of country-specific strategies within a broader regional equity agenda (World Health Organization, 2025; Guerrón-Gómez et al., 2025).

**Figure 10**

*Multivariate Analysis of Predictors of Inequitable Healthcare Access*

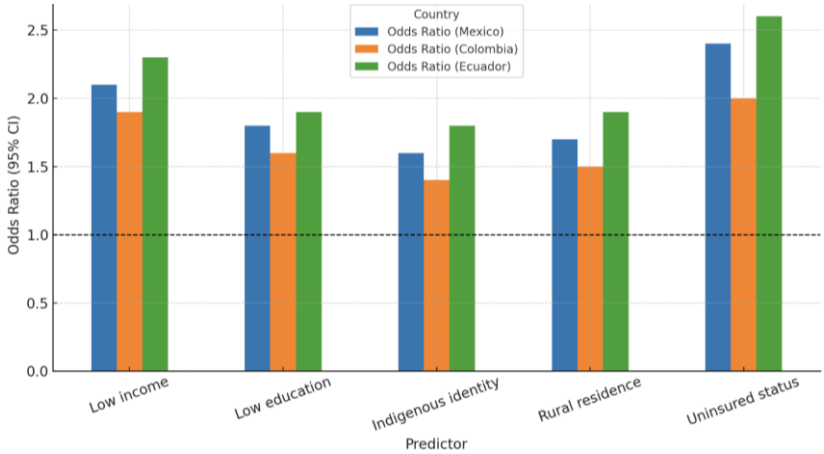

Figure 10 displays the results of a multivariate logistic regression examining key social determinants associated with inequitable access to healthcare in Mexico, Colombia, and Ecuador. Odds ratios above 1 indicate a higher likelihood of facing barriers to healthcare.

- *Low income*: Strongly associated with inequitable access in all three countries, with the highest effect observed in Ecuador (OR = 2.3), followed by Mexico (2.1) and Colombia (1.9). This underscores the persistent role of poverty as a driver of exclusion from healthcare (Álvarez-Aceves et al., 2023; World Health Organization, 2025).
- *Low education*: Educational disadvantage was a significant predictor across settings, ranging from OR 1.6 in Colombia to 1.9 in Ecuador. Limited educational attainment reduces health literacy and impedes navigation of healthcare systems (Garza & Abascal Miguel, 2025; Trujillo et al., 2025).
- *Indigenous identity*: Belonging to indigenous groups increased the risk of inequitable access, with Ecuador (OR = 1.8) and Mexico (1.6) showing stronger associations than Colombia (1.4). This finding is consistent with prior studies documenting structural exclusion and poorer service coverage among indigenous populations (Almeida et al., 2025; Armenta-Paulino et al., 2021).
- *Rural residence*: Living in rural areas raised the odds of inequitable access, particularly in Ecuador (1.9) and Mexico (1.7), compared to Colombia (1.5). These results echo evidence of geographic disparities in service availability and infrastructure (Human Rights Journal, 2024; Herrera et al., 2024).
- *Uninsured status*: The strongest predictor overall, with odds ratios of 2.6 in Ecuador, 2.4 in Mexico, and 2.0 in Colombia. Lack of insurance consistently emerged as the primary barrier to equitable healthcare access, supporting earlier findings of significant gaps in coverage (Cortés-Adame & Gómez-Dantés, 2025; Bojorquez et al., 2024).

**Comparative insights:**

Ecuador consistently exhibited higher odds ratios across most predictors, confirming the country's systemic vulnerabilities in achieving equitable access. Mexico also showed elevated risks, particularly linked to uninsured status, reflecting ongoing restructuring of its health system. Colombia performed relatively better but still showed significant inequities associated with income and insurance gaps (Rodríguez-Lopez et al., 2025; Agarwal-Harding et al., 2024).

**Overall significance:**

The regression results presented in Figure 10 demonstrate that inequitable access to healthcare is a multidimensional phenomenon shaped by intersecting social determinants. Income, education, ethnicity, residence, and insurance status operate simultaneously to constrain healthcare opportunities, reinforcing the need for multisectoral policies addressing both health system reforms and broader social inequalities (World Health Organization, 2025; Guerrón-Gómez et al., 2025).

## DISCUSSION

The present study examined how social determinants of health shape equity in access to healthcare services across Mexico, Colombia, and Ecuador. Guided by the central research question—how do social determinants influence equitable access to healthcare services in these countries—the findings provide important insights into both shared and divergent challenges within Latin America.

### Interpretation of key findings

First, sociodemographic patterns highlighted the persistence of structural vulnerabilities in all three countries. Younger populations dominated the sample, but older adults, who often require greater healthcare, were underrepresented in service utilization, a finding consistent with previous work showing gaps in elderly care across Latin America (Álvarez-Aceves et al., 2023). Education and income disparities were marked, reinforcing earlier evidence that low socioeconomic status and limited educational attainment constrain

health literacy and reduce effective service utilization (Garza & Abascal Miguel, 2025; Trujillo et al., 2025).

Insurance coverage emerged as a crucial determinant. Colombia reported the highest level of public insurance coverage, reflecting the reach of its contributory and subsidized regimes (Rodríguez-Lopez et al., 2025; Houghton et al., 2020). Conversely, Mexico and Ecuador exhibited larger uninsured populations, consistent with recent analyses of the termination of Seguro Popular in Mexico (Cortés-Adame & Gómez-Dantés, 2025) and structural weaknesses in Ecuador's health system (Almeida et al., 2025; Human Rights Journal, 2024). This gap in insurance coverage was directly linked to higher vulnerability to out-of-pocket costs and reduced service utilization, echoing global evidence that financial protection is a cornerstone of health equity (World Health Organization, 2025).

Self-rated health patterns confirmed the link between socioeconomic disadvantage and poorer perceived health outcomes. Ecuador showed the highest prevalence of poor self-rated health, aligning with studies documenting inequities in health perceptions among rural and indigenous groups (Almeida et al., 2025). Colombia, on the other hand, showed more positive self-assessments, which may reflect broader insurance coverage and service availability (Rodríguez-Lopez et al., 2025). These results echo prior findings that self-rated health is a powerful predictor of morbidity and mortality, capturing subjective dimensions not always visible in service coverage data (Álvarez-Aceves et al., 2023).

Healthcare utilization data further demonstrated cross-country variation. Colombia had higher rates of frequent users and lower percentages of those with no visits, suggesting greater system integration (Bojorquez et al., 2024; Fitzgerald et al., 2024). By contrast, Mexico and Ecuador showed higher rates of non-utilization, underscoring how gaps in insurance and systemic inefficiencies constrain access. These patterns are consistent with research documenting that geographic, financial, and cultural barriers continue to limit effective utilization of care in the region (Garza & Abascal Miguel, 2025; Guerrón-Gómez et al., 2025).

Barriers to access were multifaceted. Economic and geographic barriers—such as out-of-pocket costs, lack of transportation, and distance to facilities—were particularly acute in Ecuador and Mexico, resonating with studies showing persistent inequities in rural and low-income groups (Almeida et al., 2025; Trujillo et al., 2025). Systemic barriers, including long waiting times, medicine shortages, and service saturation, were also more pronounced in Ecuador, reflecting broader structural inefficiencies (Human Rights Journal, 2024; Guerrón-Gómez et al., 2025). Colombia showed relatively lower rates of these barriers, though challenges remain for migrants and marginalized populations (Agarwal-Harding et al., 2024).

Experiences of discrimination underscored the role of cultural and social biases in shaping access. Ethnic and socioeconomic discrimination were especially frequent in Ecuador and Mexico, consistent with evidence of systemic exclusion of indigenous groups and poorer treatment of low-income patients (Armenta-Paulino et al., 2021; Almeida et al., 2025). Colombia showed slightly lower prevalence but discrimination remained notable, reflecting regional patterns of inequality in service delivery (Rodríguez-Lopez et al., 2025; Agarwal-Harding et al., 2024). These results support previous findings that discrimination discourages care-seeking and perpetuates inequities (Serván-Mori et al., 2025; Torres-Torres et al., 2025).

Trust in health systems revealed an important paradox. While trust in doctors was relatively high across all three countries, trust in institutions lagged behind, especially in Mexico and Ecuador. This gap mirrors reports of inefficiencies, corruption, and resource shortages that undermine institutional legitimacy (Cortés-Adame & Gómez-Dantés, 2025; Guerrón-Gómez et al., 2025). Colombia's higher institutional trust may reflect greater integration of insurance and services (Rodríguez-Lopez et al., 2025), though challenges in equity remain.

Finally, the multivariate analysis demonstrated that inequitable access is driven by multiple overlapping determinants. Low income, low education, indigenous identity, rural residence, and uninsured status were all significant predictors. Uninsured status emerged as the strongest predictor across all countries, with Ecuador showing the highest odds ratios, consistent with evidence of systemic exclusion (Human Rights Journal, 2024; Almeida et al., 2025). These findings align with global reports confirming that inequities in health are not only financial but also social and structural in nature (World Health Organization, 2025).

### Implications for theory and practice

The findings reinforce the theoretical framework that social determinants are foundational to health equity (Garza & Abascal Miguel, 2025; World Health Organization, 2025). By integrating comparative data from three countries, this study expands previous analyses that have often been confined to single-country contexts (Rodríguez-Lopez et al., 2025; Cortés-Adame & Gómez-Dantés, 2025). Practically, the results highlight the need for health policies that address not only insurance coverage but also systemic inefficiencies, geographic access, and cultural discrimination (Guerrón-Gómez et al., 2025; Trujillo et al., 2025).

### Alternative explanations

While insurance coverage is a major determinant, differences in self-rated health and service utilization could also reflect broader social and political contexts. For instance, higher perceived poor health in Ecuador may not only be linked to service gaps but also to heightened expectations or sociocultural differences in reporting health (Almeida et al., 2025). Similarly, Colombia's relatively better outcomes may partly reflect methodological differences in reporting or greater urban representation in the sample (Bojorquez et al., 2024).

### Limitations

This study is not without limitations. The cross-sectional design restricts causal inference, and reliance on self-reported measures may introduce reporting bias (Álvarez-Aceves et al., 2023). Stratified sampling sought to capture diverse populations, yet some groups, particularly undocumented migrants or individuals in remote regions, may have been underrepresented (Fitzgerald et al., 2024; Agarwal-Harding et al., 2024). Additionally, while the harmonized instrument enabled cross-country comparison, contextual differences may limit direct comparability across systems (Gutiérrez et al., 2024).

### Future research

Future studies should adopt longitudinal designs to better assess causal pathways linking social determinants to health inequities. There is also a need for deeper qualitative research exploring lived experiences of discrimination and exclusion, particularly among indigenous and migrant populations (Human Rights Journal, 2024; Serván-Mori et al., 2025). Comparative policy analyses across Latin America would further illuminate why some countries, such as Colombia, have achieved broader coverage, while others continue to struggle with high levels of uninsured populations (Bojorquez et al., 2024; Cortés-Adame & Gómez-Dantés, 2025).

### Contribution to the field

Despite these limitations, this study contributes significantly to the literature by providing a comparative, multi-country analysis that integrates both quantitative and qualitative insights. By highlighting the multifactorial nature of inequities, the findings support the argument that universal health coverage cannot be achieved without addressing underlying social determinants such as poverty, education, ethnicity, and geography (Garza & Abascal Miguel, 2025; World Health Organization, 2025).

## CONCLUSION

This study examined how social determinants of health shape equity in healthcare access across Mexico, Colombia, and Ecuador. The findings demonstrated that inequities persist despite ongoing reforms and insurance expansion efforts. Uninsured status,

low income, limited education, rural residence, and indigenous identity consistently emerged as the strongest predictors of restricted access, confirming the central hypothesis that social determinants remain decisive in defining health opportunities.

The results also highlighted cross-country differences. Colombia showed relatively better outcomes in insurance coverage, healthcare utilization, and trust in institutions, while Mexico and Ecuador displayed larger uninsured populations, higher economic and geographic barriers, and greater perceptions of discrimination. These variations emphasize that health inequities are not uniform but reflect country-specific contexts shaped by policy design, resource allocation, and historical inequalities.

Theoretically, these findings reinforce the understanding that universal health coverage requires not only financial protection but also comprehensive action on social determinants such as poverty, education, and ethnicity. Practically, they suggest that policymakers should prioritize strategies that reduce out-of-pocket costs, expand services to rural and marginalized populations, and address systemic barriers such as long waiting times and medicine shortages. Addressing discrimination in healthcare delivery is equally crucial to ensure equitable treatment and restore trust in institutions.

This study acknowledges its limitations, including reliance on cross-sectional data, potential reporting biases, and contextual differences that may limit comparability across countries. Future research should adopt longitudinal designs, incorporate more representative samples of vulnerable groups such as migrants, and expand comparative analyses to other Latin American nations.

In conclusion, this work contributes to the growing evidence that achieving equity in healthcare requires moving beyond structural reforms to confront the deeper social, cultural, and economic determinants that perpetuate disparities. By synthesizing evidence from three countries, the study provides valuable insights for regional strategies aimed at advancing universal health coverage and ensuring that health systems fulfill their mandate of equity.

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## CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflicts of interest.

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