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Emigration and International Training Intentions Among Colombian Medical Students: A Multi-Institution Pilot Survey

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Abstract

Objective: Colombia faces a health workforce shortage as physicians emigrate, and recent multi-institution data on emigration intentions among Colombian medical students are limited. This pilot study assessed the feasibility of a multi-institution online survey and described Colombian medical students' intentions to train or practice abroad.

Methods: We conducted a cross-sectional online survey of medical students at one private and two public Colombian universities; the survey was open from 16 June to 10 August 2025, and each school emailed one invitation to its enrolled medical students. Feasibility was described by response, completion, item non-response, and completion time; no feasibility criteria were set in advance. Outcomes were whether students would consider additional medical training abroad and whether they would consider emigrating to practice medicine after graduation. Respondents younger than 18 years were excluded. Proportions are reported with 95% confidence intervals (CIs).

Results: Of approximately 2,200 students invited, 115 began the survey (5.2%) and 112 completed it (97.4% of those who began); five respondents younger than 18 years were excluded, leaving 107 for analysis. Item non-response was 0.7%, and the median completion time was 104 seconds. Most respondents were female (60.7%), White/Mestizo (73.8%), and from urban areas (86.9%). Overall, 97.1% (102/105; 95% CI 91.9-99.0) would consider training abroad, most often residency (88.2%), and 89.7% (96/107; 95% CI 82.5-94.2) would consider emigrating to practice medicine. With only 11 students not considering emigration, the pilot could not test differences between subgroups.

Conclusion: In this self-selected pilot sample, nearly nine in 10 Colombian medical students would consider emigrating to practice medicine. The low response rate limits generalizability and likely inflates these estimates. The pilot identified changes needed for a national survey, including repeated contacts, an institution identifier, a pretested and validated instrument, and duplicate-response controls.

Categories: Health Policy, Medical Education, Epidemiology/Public Health
Keywords: brain drain, colombia, medical education, medical workforce, migration

Introduction

In low- and middle-income countries such as Colombia, the migration of highly skilled workers is shaped by push factors, including insecurity, insufficient government investment, and political and social instability, and by pull factors such as economic and professional opportunities abroad [1].

Colombia has experienced sustained highly skilled emigration driven by its sociopolitical and economic conditions. This loss of human capital deprives the health system of trained professionals and contributes to shortages of specialists in rural areas, burnout among the remaining workforce, and lost public investment in professionals who subsequently emigrate [2,3]. Social instability, armed conflict, rising crime, and limited opportunities for professional development are among the main factors driving Colombian physicians abroad. Despite decades of attention to this trend, Colombia continues to lose health workers, widening the gap between the supply of health professionals and the growing demand for care [4].

Colombia's health system faces particular workforce challenges that make understanding emigration urgent. Although the country graduated approximately 6,300 physicians per year according to the most recent national medical education statistics, it continues to experience marked disparities in access to care, particularly in rural and underserved regions [3,5]. Physician emigration exacerbates these inequities and represents a substantial loss of investment in publicly funded medical education.

Understanding which medical students intend to leave, and why, is therefore essential for designing

targeted retention strategies. In this pilot study, we aimed to assess the feasibility of a multi-institution online survey of Colombian medical students, to inform the design of a planned national survey, and to describe the proportion of students who would consider further training abroad or emigrating to practice medicine. Whether these intentions differ by socioeconomic stratum is a question for the national survey; this pilot was not designed or powered to answer it.

Materials And Methods

We conducted a cross-sectional online survey of undergraduate medical students at three Colombian universities: Universidad El Bosque (Bogotá, Colombia), Universidad del Valle (Cali, Colombia), and Universidad del Magdalena (Santa Marta, Colombia). In June 2025, we provided the survey invitation and link to the medical program office at each institution, and each school emailed one invitation to its institutional mailing list of medical students at their convenient dates; under the agreement with each institution, the list included only currently enrolled students. No reminders were sent. The survey was open from 16 June to 10 August 2025.

Pilot studies are intended to assess the feasibility of procedures for a larger study rather than to test hypotheses [6,7]. The feasibility measures for the planned national survey were the response proportion, completion among those who began the survey, item non-response, the number of possible duplicate submissions, and the median completion time. No quantitative criteria for these measures, such as a target response per institution, were set in advance; they are reported descriptively. We describe acceptability using completion among those who began and item non-response. The reporting of this study follows the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) [8] (see Appendix A).

Study population and sample size

Every student who completed the survey was eligible. The number of students invited was not counted from the mailing lists but was estimated from total undergraduate medical enrollment as reported by the faculty liaison at each institution; these figures were consistent with publicly available program information. However, the invite link could be forwarded, and hence, enrollment at a participating school could not be verified for individual respondents. Students who did not report Colombian citizenship were excluded. Respondents younger than 18 years were excluded from all analyses.

Survey instrument

The survey instrument was a 14-item questionnaire (see Appendix B). It was developed in English by the investigators, all native Spanish speakers, who then translated it into Spanish. No formal forward-backward translation or independent bilingual review was performed. Before distribution, the Spanish version was pretested by investigators who had graduated from Colombian medical schools and by one author who is a current Colombian medical student; formal cognitive interviews were not conducted. The survey was administered in Spanish through the Qualtrics platform (Qualtrics, LLC, Provo, Utah, United States). Demographic items were adapted from the Colombia National Demographic and Health Survey [9].

The two primary outcomes were single yes/no items: whether the student would consider additional medical training abroad and whether the student would consider emigrating to practice medicine abroad after graduation. Students who would consider training abroad selected the type(s) of training considered. Two further yes/no items asked whether the student's medical school had influenced their intentions to pursue training outside Colombia (Q13) and to practice medicine outside Colombia permanently (Q14); neither asked in which direction the influence operated. Outcome items were developed by the investigators and were not previously validated. Responses were collected through a survey link that did not apply Qualtrics' duplicate-response prevention.

Ethical considerations

The Stanford University Institutional Review Board determined the study to be exempt (protocol number: 74751). Each participating institution reviewed the study through its own processes, determined that further review by its ethics committee was not required for this anonymous survey given the existing exempt determination, and signed a letter of agreement authorizing the study and the distribution of the survey to its medical students. Participants read an informed consent statement in Spanish and indicated agreement before beginning the survey; no incentives were offered, and no names or email addresses were collected. Five respondents reported ages of 16-17 years. Colombian regulations require parental permission and the minor's assent for research involving people younger than 18 years [10]; thus, their responses were excluded from all analyses. Qualtrics recorded IP addresses and approximate location by default for aggregate, individually anonymous analysis. These data are not reported, and IP addresses and location fields have been deleted from Qualtrics and from all study datasets.

Data analysis

We reported proportions with Wilson score 95% CIs, using the number answering each item as the denominator. Because few students would not consider emigrating (n = 11), the pilot was not designed or

powered to test differences between subgroups. We presented comparisons of consideration of emigration across respondent characteristics descriptively, with two-sided Fisher's exact tests (Fisher-Freeman-Halton for three-category variables) and Holm-adjusted p-values across the six comparisons; these comparisons are exploratory and do not test hypotheses. For 2×2 tables, we reported the conditional maximum-likelihood odds ratio (OR) with exact 95% CI; when a cell was zero, the OR was not estimable, and we reported the exact lower confidence bound. Because only three students would not consider training abroad, comparisons for that outcome were not made.

Responses to Q14 were reported descriptively among students who would consider emigrating and were not analyzed as an exposure. A student with no intention to emigrate has no such intention for a school to have influenced, so "No" is the natural answer for these students, and the item therefore depended on the outcome. A sensitivity analysis excluded the respondent with missing citizenship and one possible duplicate submission (two responses with identical answers to every item). Analyses were performed in Python 3.13 (SciPy 1.18; Python Software Foundation, Wilmington, Delaware, United States).

Results

A total of 2,200 students were invited. Of these, 115 began the survey (5.2%), and 112 completed it (5.1%; 97.4% of those who began). One respondent with missing citizenship data, two respondents with identical answers to every list (possible duplicate submission), and five respondents aged 16-17 years were excluded, leaving 107 respondents for analysis. Response by institution could not be calculated because the survey did not ask for the respondent's institution. Item non-response was low: 10 of 1,391 item responses (0.7%) were missing, and seven respondents (6.5%) skipped at least one item. The median completion time was 104 seconds (IQR 83-146). One possible duplicate submission was identified.

Respondents were aged 18-45 years (median 21); 65 (60.7%) were female, 93 (86.9%) had lived in an urban area before medical school, and 58 (54.2%) attended medical school in the region where they were raised. Students from all 12 semesters and all six socioeconomic strata responded (Table *1*).

Characteristic		Value
Age (years)	Median (IQR)	21 (20–23)
	Range	18–45
Sex, n (%)	Female	65 (60.7)
	Male	41 (38.3)
	Not reported	1 (0.9)
Ethnicity, n (%)	White / Mestizo / no affiliation	79 (73.8)
	Afro-Colombian / Mulatto / Raizal	17 (15.9)
	Indigenous	2 (1.9)
	Other	3 (2.8)
	Prefer not to answer / not reported	6 (5.6)
Pre-medical residence, n (%)	Urban	93 (86.9)
	Rural	14 (13.1)
	Medical school in home region	58 (54.2)
Marital status (single), n (%)		103 (96.3)
Socioeconomic stratum*, n (%)	1–2 (low)	35 (32.7)
	3–4 (middle)	53 (49.5)
	5–6 (high)	18 (16.8)
	Not reported	1 (0.9)
Semester of training, n (%)	1–4	16 (15.0)
	5–8	49 (45.8)
	9–12	41 (38.3)
	Not reported	1 (0.9)

TABLE 1: Characteristics of respondents (N=107)

*Socioeconomic stratum follows the Colombian government's six-level residential classification (1 = lowest, 6 = highest).

IQR: interquartile range

Of the 107 total respondents included in the analysis, two did not answer the question on additional medical training abroad (Q9). Of the 105 who did, 102 (97.1%; 95% CI 91.9-99.0) reported that they would consider pursuing additional medical training abroad. With regard to practicing abroad, 96 of 107 (89.7%; 95% CI 82.5-94.2) reported that they would consider emigrating to practice medicine after graduation (Figure *1A*). Among the 102 students who would consider training abroad, 90 (88.2%) reported they would consider residency, 50 (49.0%) subspecialty or fellowship training, and 39 (38.2%) a master's degree (Figure *1B*).

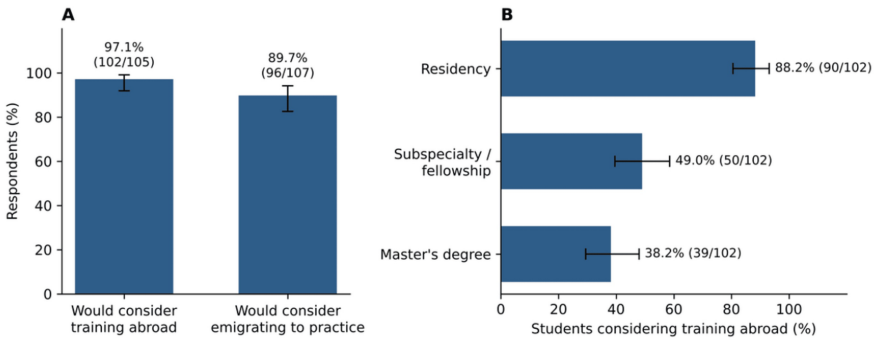


FIGURE 1: Migration-related intentions among Colombian medical students.

(A) Proportion of students who would consider additional medical training abroad (n = 105 answering) and who would consider emigrating to practice medicine after graduation (n = 107). (B) Type of training considered among the 102 students who would consider training abroad; categories are not mutually exclusive.

Error bars show Wilson 95% confidence intervals.

Claude (Anthropic, PBC, San Francisco, California, United States) was used for help with figure creation. The authors reviewed and verified the figure and take full responsibility for the content.

In exploratory comparisons, the proportion considering emigration was similar across socioeconomic strata, semesters, sex, and pre-medical residence, and between students attending medical school in or outside their home region (Table *2*, Figure *2*). With 11 students not considering emigration, these comparisons were imprecise, and all Holm-adjusted p-values were 1.00. Overall, 58 of 106 students (54.7%) reported that their medical school had influenced their intentions to train abroad. Among the 95 students who reported that they would consider emigrating and answered Q14, 34 (35.8%; 95% CI 26.9-45.8) reported that their school had influenced their intentions to practice abroad permanently. Results were similar in the sensitivity analysis (n = 105): 95 of 105 (90.5%) would consider emigrating, and no comparison had an unadjusted p-value below 0.29.

Factor		Would consider emigrating, n/N (%)	OR (95% CI)	p	Holm-adjusted p
Medical school in home region	Yes	54/58 (93.1)	2.23 (0.53–11.1)	0.339	1.00
	No	42/49 (85.7)	Reference		
School influenced intentions to train abroad	Yes	52/58 (89.7)	0.79 (0.15–3.58)	>0.99	1.00
	No	44/48 (91.7)	Reference		
Socioeconomic stratum	1–2	30/35 (85.7)	-	0.691‡	1.00
	3–4	48/53 (90.6)	-		
	5–6	17/18 (94.4)	-		
Semester	1–4	14/16 (87.5)	-	0.742‡	1.00
	5–8	44/49 (89.8)	-		
	9–12	38/41 (92.7)	-		
Sex	Female	59/65 (90.8)	1.36 (0.31–5.80)	0.746	1.00
	Male	36/41 (87.8)	Reference		
Pre-medical residence	Rural	14/14 (100)	NE (≥0.38)†	0.352	1.00
	Urban	82/93 (88.2)	Reference		

TABLE 2: Exploratory comparison of consideration of emigration by respondent characteristics of respondents

These comparisons are exploratory; the pilot was not powered to test differences between subgroups.

† Zero cell (every student in the group would consider emigrating); the exact lower 95% confidence bound is shown. ‡ Fisher–Freeman–Halton exact test across three categories.

OR is the conditional maximum-likelihood odds ratio with exact 95% CI; p is from two-sided Fisher's exact test, with Holm adjustment across the six comparisons. Denominators exclude missing answers.

NE: not estimable

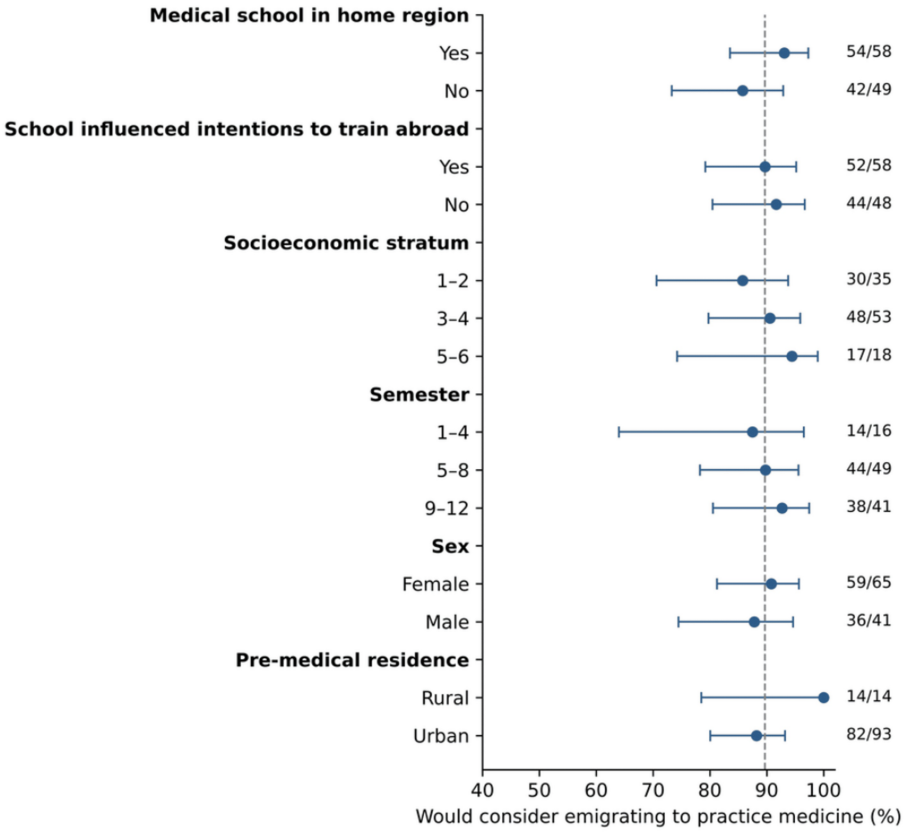


FIGURE 2: Consideration of emigration by respondent characteristics.

Points show the percentage of students in each subgroup who would consider emigrating to practice medicine, with Wilson 95% confidence intervals; numbers show n/N. The dashed line marks the overall proportion (89.7%).

n = 105–107 depending on missing answers.

Claude (Anthropic, PBC, San Francisco, California, United States) was used for help with figure creation. The authors reviewed and verified the figure and take full responsibility for the content.

Discussion

In this multi-institution pilot survey, nearly all responding Colombian medical students reported that they would consider further training abroad, and nine in 10 reported that they would consider emigrating to practice medicine. Migration intentions emerge early in medical training [11,12]. A recent global scoping review of medical students reported intentions ranging from 20.8% to 89.6% [12], but regional studies are more directly comparable. In Lima, Peru, 92.1% of 508 medical students at two private universities intended to emigrate after graduation [13], and in Colombia, 84% of 556 final-semester nursing students from 26 programs included emigration among their plans after graduation [14]. Lower proportions have been reported among medical students in Buenos Aires, Argentina (31%-36%) [15] and in Honduras (16.6%) [16]. The Red-LIRHUS (Latinoamericano para la Investigación en Recursos Humanos en Unidad/Grupo de Salud) survey of 11,072 students at 63 medical schools in 11 Latin American countries, including 11 Colombian schools, also examined students' professional expectations, including migration [17]. Differences in item wording (considering emigration versus intending or planning to emigrate) and in timing limit direct comparison. The items in the questionnaire of the present study measured willingness to consider emigration rather than firm plans, and students interested in emigration were probably more likely to respond to a survey on this topic. Both factors likely inflate our estimates relative to the full student population.

The strong interest in residency abroad (88.2% of students who would consider training abroad) should be read in the context of Colombian postgraduate training. Law 1917 of 2018 established the national residency system, requiring that residents receive a monthly educational support of no less than three legal monthly minimum wages and capping residency tuition at the institution's administrative and operating costs [18]. This pilot could not assess whether these provisions, or the availability of residency positions, shape students' interest in training abroad.

Because only 11 respondents would not consider emigrating, the pilot cannot show whether intentions differ by socioeconomic stratum, semester, sex, rural origin, or training in one's home region, and the similar proportions observed should not be read as evidence that intentions are uniform across groups. Prior studies identify family and community ties as among the strongest determinants of non-migration among health workers and medical students [11,12,19]. Testing these relationships, including differences by socioeconomic stratum, should be an aim of a national survey.

About one in three students who would consider emigrating reported that their school had influenced their intentions to practice abroad permanently. Because this item depends on the outcome, refers to permanent practice, and did not ask in which direction the influence operated, we report it descriptively and do not interpret it as a determinant of emigration intentions.

As a pilot, the study informs the design of a national survey. No feasibility criteria were set in advance, which limits formal judgement of feasibility, so we reported the measures descriptively. Among students who began the survey, 97.4% completed it, item non-response was 0.7%, and the median completion time was under two minutes, suggesting that the instrument was brief and acceptable to those who opened it. Recruitment was the critical weakness: about one in 20 invited students responded to a single email with no reminders, and without an institution item, response could not be assessed by school.

Limitations and future plans

This study has several limitations. The response rate of about 5% and voluntary participation create substantial risk of self-selection bias, which limits generalizability and likely overestimates the prevalence of emigration intentions. The number invited was estimated from enrollment reported by coordinating faculty at each institution rather than counted from the mailing lists, so the response rate is approximate. The link could be forwarded, so enrollment at a participating school could not be verified for individual respondents. Duplicate submissions were not prevented; however, only one possible duplicate was identified. Each school chose when to send the invitation, and the survey was open between June and August, a period that may overlap mid-year breaks in Colombian academic calendars and may have reduced response. The questionnaire was written in English and translated by the investigators without forward-backward translation or cognitive interviews, and the outcomes were single, unvalidated yes/no items that measured willingness to consider emigration rather than concrete plans. Finally, the cross-sectional design cannot assess changes in intentions over time or actual migration, and the small number of students not considering emigration precluded multivariable analysis.

To mitigate these limitations, we plan to (i) set feasibility and response targets in advance; (ii) use multiple contact attempts with varied messaging; (iii) offer economic and non-economic incentives for participation; (iv) partner with ASCOFAME (Asociación Colombiana de Facultades de Medicina or the Colombian Association of Medical Schools) for nationwide dissemination; (v) use survey links with duplicate-response prevention; (vi) add items that distinguish plans from willingness; (vii) adapt cognitive interviews with Colombian students; and (viii) conduct follow-up qualitative interviews to explore the motivations behind emigration intentions.

Conclusions

In this pilot survey, nearly nine in 10 responding Colombian medical students reported that they would consider emigrating to practice medicine, and almost all would consider training abroad. Although these estimates are likely inflated by self-selection, they warrant a larger, representative assessment.

Appendices

Appendix A

Item	Report
Design	Cross-sectional web survey; convenience sample of enrolled undergraduate medical students at three Colombian universities, invited through each school's institutional mailing list
Ethics approval	Stanford IRB exempt determination (protocol 74751); signed letters of agreement from all three institutions, each of which determined that further ethics committee review was not required
Informed consent	Spanish-language consent statement on the first screen describing purpose, expected duration (about 10 minutes), voluntary participation, absence of payment, data storage and investigator and IRB contacts; agreement required to proceed
Data protection	Data stored according to Stanford University standards; no names or email addresses collected; IP addresses and location fields deleted
Development and pretesting	Developed in English by the investigators and translated into Spanish by them; pretested by investigators who graduated from Colombian medical schools and by one current Colombian medical student; no cognitive interviews. Investigators are native Spanish speakers.
Recruitment	Survey invitation and link provided to each school in June 2025; each school chose when to send one email to its enrolled medical students; no reminders; no incentives
Administration	Qualtrics; open 16 June to 10 August 2025; 14 items after consent; Q10 shown only if Q9 = Yes; no randomization of items; items could be skipped
Response rates	View rate: not available. Participation rate: 115 of approximately 2,200 invited (5.2%). Completion rate: 112 of 115 (97.4%)
Preventing multiple entries	Duplicate-response prevention not applied; responses screened for identical answers to every item (one possible duplicate, excluded in sensitivity analysis)
Analysis	Three incomplete responses (ended before outcome items) and five respondents younger than 18 years excluded; no exclusion by completion time (median 104 seconds); no weighting

TABLE 3: CHERRIES checklist (Checklist for Reporting Results of Internet E-Surveys)

Appendix B

The survey was translated by native speakers and administered in Spanish. An informed consent statement was presented to all participants before the survey. The questionnaire was developed by the authors for this study and is not a copyrighted or licensed instrument; it may be freely used and adapted with citation of this article.

Section	Español (como se administró)	English translation
Description	DESCRIPCIÓN: Está invitado a participar en un estudio de investigación sobre los factores que pueden contribuir a que los estudiantes de medicina decidan emigrar para continuar su práctica médica fuera de Colombia. Se le pedirá que complete una encuesta. La participación en esta investigación es voluntaria, y usted es libre de retirar su consentimiento en cualquier momento.	DESCRIPTION: You are invited to participate in a research study on the factors that may contribute to medical students deciding to emigrate to continue their medical practice outside Colombia. You will be asked to complete a survey. Participation in this research is voluntary, and you are free to withdraw your consent at any time.
Duration	DURACIÓN: Su participación tomará aproximadamente 10 minutos.	DURATION: Your participation will take approximately 10 minutes.
Payments	PAGOS: No recibirá ningún pago por su participación.	PAYMENTS: You will not receive any payment for your participation.
Privacy and confidentiality	PRIVACIDAD Y CONFIDENCIALIDAD: Los riesgos asociados con este estudio son mínimos. Los datos del estudio se almacenarán de manera segura, en cumplimiento con los estándares de la Universidad de Stanford, minimizando el riesgo de una violación de la confidencialidad. Su privacidad individual se mantendrá durante la investigación y en todos	PRIVACY AND CONFIDENTIALITY: The risks associated with this study are minimal. Study data will be stored securely, in compliance with Stanford University standards, minimizing the risk of a breach of confidentiality. Your individual privacy will be maintained during the research and in all published and written data

	los datos publicados y escritos resultantes del estudio.	resulting from the study.
Contact: questions	INFORMACIÓN DE CONTACTO: Preguntas: Si tiene alguna pregunta, inquietud o queja sobre esta investigación, sus procedimientos, riesgos y beneficios, comuníquese con el Director del Protocolo, Dr. Juan Pablo Forero, MD, al correo electrónico Jforero@stanford.edu.	CONTACT INFORMATION: Questions: If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, contact the Protocol Director, Dr. Juan Pablo Forero, MD, by email at Jforero@stanford.edu.
Contact: independent	Contacto independiente: Si no está satisfecho con la forma en que se lleva a cabo este estudio, o si tiene alguna inquietud, queja o pregunta general sobre la investigación o sus derechos como participante, comuníquese con la Junta de Revisión Institucional (IRB) de Stanford para hablar con alguien independiente del equipo de investigación al +1-650-723-5244 o sin costo al +1-866-680-2906. También puede escribir a la IRB de Stanford, Stanford University, 1705 El Camino Real, Palo Alto, CA 94306.	Independent contact: If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints or general questions about the research or your rights as a participant, contact the Stanford Institutional Review Board (IRB) to speak with someone independent of the research team at +1-650-723-5244 or toll-free at +1-866-680-2906. You may also write to the Stanford IRB, Stanford University, 1705 El Camino Real, Palo Alto, CA 94306.
Consent	Si está de acuerdo en participar en esta investigación, seleccione sí.	If you agree to participate in this research, select yes.
Options	Sí; No	Yes; No

Item	Español (como se administró)	English translation
Q1	¿Es usted ciudadano colombiano? Opciones: Sí; No	Are you a Colombian citizen? Options: Yes; No
Q2	¿Con cuál de las siguientes opciones se identifica? Opciones: Hombre; Mujer; No binario; Prefiero no decir; Otro (texto libre)	Which of the following options do you identify with? Options: Man; Woman; Non-binary; Prefer not to say; Other (free text)
Q3	¿Cuál es su edad? Respuesta numérica (texto libre)	What is your age? Numeric entry (free text)
Q4	¿Con cuál grupo étnico se identifica como parte de su identidad cultural? Opciones: Afrocolombiano, mulato, descendencia africana; Indígena; Sin afiliación, blanco o mestizo; Prefiero no responder; Otro (texto libre)	Which ethnic group do you identify with as part of your cultural identity? Options: Afro-Colombian, Mulato, African descent; Indigenous; No affiliation, White or Mestizo; Prefer not to answer; Other (free text)
Q5	Antes de entrar a la facultad/escuela de medicina, ¿cuál de las siguientes opciones describe mejor su lugar de residencia principal? Opciones: Urbana; Rural	Before entering medical school, which of the following best describes your primary place of residence? Options: Urban; Rural
Q6	¿Su facultad/escuela de medicina se encuentra en la misma región donde se crió? Opciones: Sí; No	Is your medical school located in the same region where you were raised? Options: Yes; No
Q7	¿Cuál es su estado civil? Opciones: Casado; Unión libre; Soltero; Viudo; Divorciado o separado	What is your marital status? Options: Married; Common-law union; Single; Widowed; Divorced or separated
Q8	¿Qué estrato socioeconómico describe mejor su hogar? Opciones: 1; 2; 3; 4; 5; 6	Which socioeconomic stratum best describes your household?[a] Options: 1; 2; 3; 4; 5; 6
Q9	¿Consideraría realizar formación médica adicional en el extranjero? Opciones: Sí; No	Would you consider pursuing additional medical training abroad? Options: Yes; No
Q10[b]	¿Cuál de las siguientes opciones consideraría realizar en el extranjero? Opciones: Maestría; Residencia; Subespecialización / Fellow (puede seleccionar más de una)	Which of the following options would you consider pursuing abroad? Options: Master's degree; Residency; Subspecialty / Fellowship (more than one may be selected)
Q11	¿Consideraría emigrar para ejercer medicina en el extranjero después de graduarse de la universidad? Opciones: Sí; No	Would you consider emigrating to practice medicine abroad after graduating from university? Options: Yes; No
Q12	¿En qué semestre se encuentra? Opciones: 1 a 12	What semester are you in? Options: 1 to 12
Q13	¿Su escuela de medicina ha influido en sus intenciones de realizar entrenamiento médico adicional fuera de Colombia? Opciones: Sí; No	Has your medical school influenced your intentions to pursue additional medical training outside Colombia? Options: Yes; No
Q14	¿Su escuela de medicina ha influido en sus intenciones de ejercer medicina fuera de Colombia de forma permanente? Opciones: Sí; No	Has your medical school influenced your intentions to practice medicine outside Colombia permanently? Options: Yes; No

TABLE 4: Informed consent and Survey Instrument in Spanish and English

Items were shown in the order listed. All items allowed one answer, except Q10, which allowed more than one. The labels "Opciones/Options" and the response-format descriptions for Q3 and Q12 are editorial.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Juan Pablo Forero, Sebastian Amaya, Benilda Garcia Mercado, Masaki Kojima

Acquisition, analysis, or interpretation of data: Juan Pablo Forero

Drafting of the manuscript: Juan Pablo Forero, Sebastian Amaya, Masaki Kojima

Critical review of the manuscript for important intellectual content: Juan Pablo Forero, Benilda Garcia Mercado, Masaki Kojima

Supervision: Juan Pablo Forero

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Stanford University issued approval 74751 (exempted). **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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References

1. Urbański M: Comparing push and pull factors affecting migration . Economies. 2022, 10:21. 10.3390/economies10010021
2. Larrotta-Castillo D, Cruz-Marroquín C, Rodríguez-Peñuela J, Alzate-Granados JP, Cote-Menéndez M, Galván-Villamarín JF: Unpaid burnout: prevalence of burnout among residents at a Colombian university (Article in Spanish). Rev Fac Med. 2021, 69:82687. 10.15446/revfacmed.v69n1.82687
3. La Republica: Colombia has the fewest healthcare professionals per 1,000 inhabitants (Webpage in Spanish) . (2023). Accessed: 2026: https://www.larepublica.co/globoeconomia/numero-de-medicos-y-enfermeras-por-cada-1-000-habitantes-en-paises-ocde-3553043.
4. Carpio C, Santiago Bench N: The Health Workforce in Latin America and the Caribbean: An Analysis of Colombia, Costa Rica, Jamaica, Panama, Peru, and Uruguay. The World Bank, Washington, D.C.; 2015. 10.1596/978-1-4648-0594-3
5. Escobar Gaviria RH: Basic Statistics on Medical Education in Colombia 2016 (Document in Spanish) . Asociación Colombiana de Facultades de Medicina (ASCOFAME), Bogotá, Colombia; 2017. https://ascofame.org.co/biblioteca/Documentos/Estadi%CC%81sticasFacultades2016.pdf.
6. Thabane L, Ma J, Chu R, et al.: A tutorial on pilot studies: the what, why and how . BMC Med Res Methodol. 2010, 10:1. 10.1186/1471-2288-10-1
7. Leon AC, Davis LL, Kraemer HC: The role and interpretation of pilot studies in clinical research . J Psychiatr Res. 2011, 45:626-9. 10.1016/j.jpsychires.2010.10.008
8. Eysenbach G: Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). J Med Internet Res. 2004, 6:e34. 10.2196/jmir.6.3.e34
9. Colombia National Demographic and Health Survey 2015 (Document in Spanish). Profamilia and Ministry of Health, Bogotá, Colombia; 2017. https://dhsprogram.com/pubs/pdf/FR334/FR334.pdf.
10. Resolution 8430 of 1993 (Document in Spanish). Ministry of Health, Bogotá, Colombia; Bogotá. https://www.minsalud.gov.co/sites/rid/lists/bibliotecadigital/ride/de/dij/resolucion-8430-de-1993.pdf.
11. Toyin-Thomas P, Ikhurionan P, Omoyibo EE, et al.: Drivers of health workers' migration, intention to migrate and non-migration from low/middle-income countries, 1970-2022: a systematic review. BMJ Glob Health. 2023, 8:10.1136/bmjgh-2023-012338
12. Ser GT, Teng ZS, Yusni YZ, Ooi KS, Wong ZY, Tejpal Singh PS, Hong WH: A scoping review on medical

students' international migration: trends, determinants, and implications for global health workforce planning. Hum Resour Health. 2025, 23:67. 10.1186/s12960-025-01027-x
13. Medina-Ramirez SA, Taype-Rondan A: Intention to emigrate after graduation among medical students from two universities in Lima, Peru. PLoS One. 2026, 21:e0342477. 10.1371/journal.pone.0342477
14. Peña-Alfaro BS, Torres Díaz NV: Intention, motivations, and barriers to emigration of nursing students in Colombia. Invest Educ Enferm. 2024, 42:13. 10.17533/udea.iee.v42n3e13
15. Pereyra V, Díaz JC, Casin Fijtman G, Zerega PJ, Politi MT: Teaching assistants in Argentina have greater intentions to migrate abroad as physicians than other medical students (Article in Spanish). Rev Fac Cien Med Univ Nac Cordoba. 2024, 81:318-35. 10.31053/1853.0605.v81.n2.42855
16. Zambrano LI, Pereyra-Elías R, Reyes-García SZ, Fuentes I, Mayta-Tristán P: Influence of parental education on Honduran medical students' labour perspectives: rural work and emigration. Can J Rural Med. 2015, 20:121-8.
17. Mayta-Tristán P, Pereyra-Elías R, Montenegro-Idrogo JJ, Mejia CR, Inga-Berrospi F, Mezones-Holguín E: Profile and professional expectations of medical students from 11 Latin American countries: the Red-LIRHUS project. BMC Res Notes. 2017, 10:159. 10.1186/s13104-017-2479-y
18. Law 1917 of 2018 (Document in Spanish). Congress of the Republic of Colombia, Bogotá, Colombia; 2018. https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=87441.
19. Adovor E, Czaika M, Docquier F, Moullan Y: Medical brain drain: how many, where and why? . J Health Econ. 2021, 76:102409. 10.1016/j.jhealeco.2020.102409