

## Scientific Profile of Medical Technologists Registered as Researchers in Peru

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**Objective.** To describe the scientific profile of Medical Technologists registered as researchers in the National Registry of Scientific, Technological, and Technological Innovation (RENACYT) of Peru.

**Materials and Methods.** A descriptive cross-sectional study was conducted using secondary data from official databases, including RENACYT, CTI Vitae, and the National Registry of Academic Degrees and Professional Titles of the National Superintendence of Higher University Education (SUNEDU). Medical Technologists registered as researchers in RENACYT up to June 8, 2026, were identified. Academic, professional, and scientific characteristics were analyzed using descriptive statistics.

**Results.** Among 23,200 licensed Medical Technologists in Peru, 105 (0.5%) were identified as RENACYT researchers. Most researchers were male (64.8%), had a master's degree (41.9%) or doctoral degree (39.0%), and worked mainly in universities (63.7%). The most represented professional area was Clinical Laboratory and Anatomical Pathology (71.3%), followed by Physical Therapy and Rehabilitation (18.1%). Regarding RENACYT researcher classification, the highest proportion corresponded to Level VII (41.0%), whereas higher categories showed lower representation. Most researchers were active at the time of evaluation (88.6%).

**Conclusion.** Medical Technologists registered as RENACYT researchers represent a small proportion of the profession in Peru. Their scientific activity is mainly concentrated in university institutions and in the area of Clinical Laboratory and Anatomical Pathology. These findings highlight the need to strengthen research training, postgraduate education, and institutional opportunities to promote scientific development among Medical Technologists.

**Abbreviations:** RENACYT=National Registry of Scientific Technological and Technological Innovation; CTI Vitae=Curriculum Vitae for Science Technology and Innovation; SUNEDU=National Superintendence of Higher University Education.

**Keywords:** Medical Laboratory Personnel, Biomedical Research, Research Personnel, Scientific and Technical Activities, Health Workforce.

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## Introduction

The National Registry of Science, Technology, and Technological Innovation (RENACYT) is Peruvian's official system for identifying, classifying, and recognizing researchers in science, technology, and innovation, considering their academic background, scientific output, and research career. Registered researchers are categorized into levels established by the National Council for Science, Technology, and Innovation (CONCYTEC), making it an important tool for evaluating scientific activity, promoting the development of research capacities, and strengthening research in the country's institutions.<sup>1-3</sup>

In recent years, Peru has shown progressive growth in its scientific output. Between 2013 and 2022, publications indexed in Scopus increased from 1594 to 9391 articles, primarily due to policies strengthening research, the implementation of the amendment N° 30220, known as the university law, and actions promoted by CONCYTEC. However, despite this growth, the country's scientific participation remains limited compared to other countries in the region. Furthermore, the number of researchers per million inhabitants remains low, highlighting the need to strengthen the human capital dedicated to generating scientific knowledge.<sup>4-8</sup> Within this context, health sciences represent one of the main research fields in the country, accounting for a significant proportion of Peruvian scientific publications and showing sustained growth over the last few decades.<sup>9</sup> Internationally, innovation indicators show that Peru still faces challenges in consolidating its scientific and technological system. In 2025, the country ranked 80th out of 139 economies in the Global Innovation Index; moreover, investment in research and development (R&D) represented approximately 0.18% of gross domestic product, a figure lower than that of countries with greater scientific development. These limitations are related to the insufficient availability of highly specialized researchers and the unequal distribution of scientific capabilities in

strategic areas, factors that condition knowledge generation and national innovation.<sup>10,11</sup> Similarly, bibliometric studies have shown that Peru's contribution to Latin American scientific production is still small compared to countries with more established research sectors.<sup>12</sup> According to CONCYTEC (2026), Peruvian scientific output continues to increase, reaching 11,220 publications in 2024, accompanied by an increase in national institutional leadership in research, which rose from 65.9% in 2018 to 75.6% in 2024, reflecting greater participation of Peruvian institutions in knowledge generation.<sup>13</sup> In the health sector, institutions such as the Edgardo Rebagliati Martins National Hospital of EsSalud and the Ministry of Health stand out for their contribution to national scientific production and the development of evidence for health decision-making.<sup>14,15</sup> In this context, Medical Technologists play a relevant role within the health system due to their participation in specialized areas related to diagnosis, treatment, prevention, and health research.

Scientific research is part of the professional responsibilities of Medical Technologists. The Code of Ethics of the Peruvian College of Medical Technologists (CTMP) recognizes doing research as an activity oriented toward the development of knowledge, under principles of scientific integrity, social responsibility, and respect for ethical standards in research.<sup>16</sup> However, despite the growth of scientific research in Peru and the strengthening of researcher evaluation systems, there is limited evidence regarding the incorporation of Medical Technologists into the RENACYT system. Currently, it is unknown how these professionals are distributed according to areas of specialization, categories, scientific output, and academic characteristics, which hinders understanding their contribution to national scientific development.

Therefore, this study aimed to describe the scientific profile of Medical Technologists registered in the National Registry of Science, Technology, and Technological Innovation of Peru through a cross-sectional study.

## Materials and Methods

### *Study Design*

A cross-sectional descriptive study was conducted using information from secondary registries: a) the Registry of Natural Persons Conducting Science, Technology, and Innovation Activities (RENACYT) in Peru, administered by the National Council for Science, Technology, and Technological Innovation (CONCYTEC); b) the CTI Vitae platform (<https://ctivitae.concytec.gob.pe/appDirectorioCTI/>), used for the identification and review of researcher profiles; and c) the National Registry of Academic Degrees and Professional Titles of the National Superintendency of Higher University Education (SUNEDU), used to verify the academic qualifications of the identified professionals (<https://www.sunedu.gob.pe/registro-nacional-de-grados-y-titulos/>).

### *Study Population*

The study population consisted of Medical Technology professionals registered as researchers in RENACYT as of June 8, 2026. Participants were identified through an initial search in the CONCYTEC CTI Vitae Directory, using the filter for researchers. To locate Medical Technology professionals, terms related to their main areas of professional practice were used.

For the Clinical Laboratory and Anatomical Pathology areas, the terms “clinical laboratory” and “laboratory technician” were used. In the areas of Physical Therapy and Rehabilitation, Occupational Therapy, and Speech Therapy, the terms “physical therapy,” “therapist,” “physiotherapy,” “occupational therapy,” and “speech therapy” were used. For Radiology, the terms “radiology,” “radiology imaging,” and “tomography” were considered; while for Optometry, “optometry” and “optometrist” were used. The identified records were subsequently verified on the RENACYT researcher search platform using each researcher's corresponding code to confirm their official registration. Likewise, academic degrees and professional titles were

corroborated through the consultation platform of the National Superintendency of Higher University Education (SUNEDU).

After the search, review, and refinement process of the identified records, profiles that did not correspond to Medical Technology professionals or that lacked sufficient information for confirmation were excluded. Finally, a study population of 105 Medical Technologists registered as researchers in RENACYT was obtained.

A coded database without personal identifiers was created, incorporating variables related to the academic, professional, and scientific characteristics of the Medical Technologists registered in RENACYT. These variables allowed for the characterization of the academic, professional, and scientific distribution of Medical Technologists participating in research within the national science, technology, and innovation system. Data Collection Procedure

Information was obtained through individual review of the profiles available in CTI Vitae and RENACYT. For each identified researcher, data related to academic background, professional specialty, institutional affiliation, active status, and researcher category were recorded.

The collected information was organized into a structured database and subsequently reviewed to verify the consistency of the records. The data was anonymized before statistical analysis, preventing the inclusion of information that could individually identify participants.

### *Statistical Analysis*

The database was initially organized in Microsoft Excel 2016® (Microsoft Corporation, Redmond, WA, USA) and subsequently exported for statistical analysis using IBM SPSS Statistics version 30.0® (IBM Corp., Armonk, NY, USA). A descriptive analysis of the characteristics of the Medical Technologists registered in RENACYT was performed. Categorical variables were expressed using absolute and relative frequencies. To assess associations between categorical variables,

Pearson's chi-square test or Fisher's exact test was used, as appropriate.

### Ethical considerations

The study used secondary data from public records managed by CONCYTEC and SUNEDU. Because no direct contact was made with participants and no personal identifiable information was used, informed consent was not required. Data handling was conducted in accordance with the principles of confidentiality, scientific integrity, and responsible use of data for research purposes.

## Results

As of April 23, 2026, the Peruvian College of Medical Technologists registered 23,200 professionals with current licenses. Through a search and verification of records in the National Registry of Science, Technology, and Technological Innovation (RENACYT), 105 (0.5%) Medical Technologists registered as researchers were identified, comprising the population analyzed in this study.

**Table 1.** Academic and professional profile of Medical Technologists registered in RENACYT, Peru (N=105)

| Characteristic                                       | n (%)     |
|------------------------------------------------------|-----------|
| <b>Sex</b>                                           |           |
| Female                                               | 37 (35,2) |
| Male                                                 | 68 (64,8) |
| <b>Master's Degree</b>                               |           |
| No                                                   | 61 (58,1) |
| Yes                                                  | 44 (41,9) |
| <b>Doctoral Degree</b>                               |           |
| No                                                   | 64 (61)   |
| Yes                                                  | 41 (39)   |
| <b>Second Professional Specialization</b>            |           |
| No                                                   | 85 (81)   |
| Yes                                                  | 20 (19)   |
| <b>Employee's Institution according to CTI Vitae</b> |           |
| University                                           | 67 (63,7) |
| Health Institution                                   | 19 (18,1) |
| Research Institute                                   | 17 (16,2) |
| Other                                                | 2 (2,0)   |

Among the Medical Technologists registered in RENACYT, academic and professional characteristics related to gender, postgraduate training, second specialization, and employment institution were described, revealing a

greater presence of male professionals and those affiliated with university institutions (Table 1).

Regarding the scientific and professional characteristics of the Medical Technologists registered in RENACYT, the researcher category, professional area, activity status, and region of the Peruvian College of Medical Technologists were described. The largest representation corresponded to researchers classified in RENACYT category VII, predominantly from the professional areas of Clinical Laboratory and Anatomical Pathology; likewise, most were active and belonged to Region I of the CTMP (Table 2).

**Table 2.** Scientific and professional characteristics of Medical Technologists registered in RENACYT, Peru (N=105)

| Characteristic                                  | n (%)     |
|-------------------------------------------------|-----------|
| <b>Researcher Category according to RENACYT</b> |           |
| Distinguished Researcher                        | 6 (5,7)   |
| Level I                                         | 2 (1,9)   |
| Level II                                        | 8 (7,6)   |
| Level III                                       | 13 (12,4) |
| Level IV                                        | 12 (11,4) |
| Level V                                         | 9 (8,6)   |
| Level VI                                        | 12 (11,4) |
| Level VII                                       | 43 (41)   |
| <b>Medical Technology specialty</b>             |           |
| Clinical Laboratory                             | 75 (71,3) |
| Physical Therapy and Rehabilitation             | 19 (18,1) |
| Radiology                                       | 6 (5,7)   |
| Occupational Therapy                            | 3 (2,9)   |
| Speech Therapy                                  | 1 (1,0)   |
| Optometry                                       | 1 (1,0)   |
| <b>Activity Status as of June 8, 2026</b>       |           |
| Active                                          | 93 (88,6) |
| Expired                                         | 12 (11,4) |
| <b>Registered in RENACYT by CTMP Region*</b>    |           |
| I                                               | 98 (93,2) |
| II                                              | 3 (2,9)   |
| IV                                              | 2 (1,9)   |
| VIII                                            | 1 (1,0)   |
| XI                                              | 1 (1,0)   |

\* Medical Technological College of Peru, Y: Lima, Callao and Ica; II: Lambayeque, Amazonas, Cajamarca and San Martin; IV: Junín, Huancavelica and Ayacucho; VIII: Loreto; XI: Tacna and Moquegua

**Table 3.** Bivariate analysis of the academic and professional characteristics of Medical Technologists according to sex and grouped category of the RENACYT researcher (N=105)

| Characteristic        |          | Male<br>n (%) | Female<br>n (%) | Valor p | Group 1<br>n (%) | Group 2<br>n (%) | Valor p |
|-----------------------|----------|---------------|-----------------|---------|------------------|------------------|---------|
| Master's Degree       |          |               |                 |         |                  |                  |         |
|                       | No       | 24(64,9)      | 37(54,4)        | 0,300   | 18(62,1)         | 43(56,6)         | 0,610*  |
|                       | Yes      | 13(35,1)      | 31(45,6)        |         | 11(37,9)         | 33(43,4)         |         |
| Doctoral Degree       |          |               |                 |         |                  |                  |         |
|                       | No       | 22(59,5)      | 42(61,8)        | 0,817   | 18(62,1)         | 46(60,5)         | 0,885*  |
|                       | Yes      | 15(40,5)      | 26(38,2)        |         | 11(37,9)         | 30(39,5)         |         |
| Works at a University |          |               |                 |         |                  |                  |         |
|                       | No       | 16(43,2)      | 22(32,4)        | 0,267   | 11(37,9)         | 27(35,5)         | 0,819*  |
|                       | Yes      | 21(56,8)      | 45(67,6)        |         | 18(62,1)         | 49(64,5)         |         |
| Second Specialization |          |               |                 |         |                  |                  |         |
|                       | No       | 29(78,4)      | 56(82,4)        | 0,620   | 23(79,3)         | 62(81,6)         | 0,791*  |
|                       | Yes      | 8(21,6)       | 12(17,6)        |         | 6(20,7)          | 14(18,4)         |         |
| Activity Status       |          |               |                 |         |                  |                  |         |
|                       | Inactive | 5(13,5)       | 7(10,3)         | 0,620   | 12(41,4)         | 0(0)             | 0,000** |
|                       | Active   | 32(86,5)      | 61(89,7)        |         | 17(58,6)         | 76(100)          |         |

Group 1: Distinguished, Levels I, II, and III. Group 2: Levels IV, V, VI, and VII.

\*Pearson's Chi-squared test \*\*Fischer's Exact Test

The bivariate analysis of the academic and professional characteristics of the Medical Technologists registered in RENACYT showed no statistically significant differences by sex in relation to master's degree ( $p=0.300$ ), doctoral degree ( $p=0.817$ ), university employment ( $p=0.267$ ), second specialty ( $p=0.620$ ), or active status ( $p=0.620$ ). Likewise, when comparing by the researcher's RENACYT category, no significant differences were found in master's degree ( $p=0.610$ ), doctoral degree ( $p=0.885$ ), university employment ( $p=0.819$ ), or second specialty ( $p=0.791$ ). However, the activity status showed a statistically significant association with the grouped category of the RENACYT researcher (Fisher's exact test,  $p<0.001$ ), with differences observed in the distribution of active and expired researchers between both classification groups (Table 3)

## Discussion

This study identified 105 Medical Technologists registered as RENACYT researchers among the 23,200 qualified professionals in Peru, representing approximately 0.45% of the total. This participation should be interpreted within the national research context, where there are

approximately 14,560 researchers for a Peruvian population of nearly 34 million inhabitants, equivalent to around 428 researchers per million inhabitants. Although this indicator allows for an assessment of national scientific capacity, it remains lower than that observed in countries with more consolidated scientific systems. According to international data, there are significant differences in the availability of researchers per million inhabitants, with higher values in higher-income countries due to greater levels of investment in research and development (R&D), scientific infrastructure, and human capital development.<sup>11,17-19</sup>

The proportion of Medical Technologists working as researchers is lower compared to other health professionals with a longer history of involvement in research. Among medical researchers in Peru, a study identified 723 professionals registered with RENACYT, representing 10.5% of all researchers and approximately 0.75% of registered physicians.<sup>20</sup> Similarly, in an analysis conducted using the former "Monge Medrano" classification, physicians represented 26.91% (190/706) of the researchers evaluated.<sup>21</sup> These differences demonstrate that integration into the scientific

system is not uniform across health professions.

Regarding academic qualifications, the Medical Technologists registered with RENACYT included professionals with postgraduate studies; 41.9% (44/105) held a master's degree and 39.0% (41/105) a doctoral degree. However, these proportions were lower compared to research groups in the medical and health sciences with more extensive scientific experience. Among researchers evaluated under the aforementioned classification, 80.3% held a master's degree, 71.2% a doctorate, and 84% were university professors.<sup>21</sup> Similarly, Mayta-Tristán et al. found that, of 1,848 individuals with doctoral degrees in Peru, only 262 (14.2%) belonged to the medical and health sciences, and approximately a quarter of them had research activity recognized through REGINA or indexed scientific publications.<sup>22</sup> Likewise, the Bicentennial Plan identified that a limited proportion of professionals with doctoral degrees in medical and health sciences engaged in research activities, demonstrating that advanced academic training needs to be complemented by research opportunities and scientific output.<sup>23</sup> These results show that attaining higher academic degrees is an important, but not sufficient, component for becoming a recognized researcher.

Regarding gender, the present study found greater male participation among Medical Technologists registered with RENACYT. This result coincides with that reported by researchers in the medical and health sciences, where 65.3% were male.<sup>21</sup> However, female participation in scientific research varies by region and discipline.<sup>24</sup> International data indicate that women represent approximately 31.4% of researchers worldwide, while in Latin America and the Caribbean this proportion reaches nearly 45%.<sup>19</sup> In the present study, although there was a higher proportion of male researchers, no statistically significant differences were found by gender in the academic and professional characteristics evaluated.

Regarding the professional area, Medical Technologists registered with RENACYT were

primarily concentrated in Clinical Laboratory and Anatomical Pathology (71.3%), followed by Physical Therapy and Rehabilitation (18.1%) and Radiology (5.7%). Currently, there are no national studies describing the distribution of researchers specifically by area of Medical Technology, so these results constitute a first approximation for this profession. However, the greater presence of the Clinical Laboratory area may be related to its proximity to biomedical and diagnostic research. In Peru, medical sciences represent approximately 31.2% of national scientific output, constituting one of the areas with the highest research activity.<sup>13</sup> Likewise, a bibliometric analysis of scientific publications in health in Latin America showed that Brazil accounted for 58.55% of regional production, followed by Cuba (10.52%) and Colombia (8.30%), highlighting significant differences in scientific capacity between countries.<sup>12</sup>

The employment institution was another relevant aspect of the identified profile. In this study, 67 (63.7%) Medical Technologists working as researchers were employed at universities, while 19 (18.1%) worked at health-care institutions and 17 (16.2%) at research institutes. This university predominance coincides with the role of universities as the primary spaces for research training, scientific production, and the development of academic groups. Bibliometric studies conducted at Peruvian universities using Scopus analyzed 2,927 publications between 2014 and 2023, finding that institutional policies, scientific collaboration, and research strategies influence scientific production and visibility, although differences in productivity and impact persist among institutions.<sup>25</sup> Similarly, among physician researchers in the United States, it was observed that 24% of those with academic affiliations participated in research, compared to lower participation in other groups, highlighting the importance of the university environment for developing scientific activity.<sup>26</sup> Regarding the RENACYT classification, Medical Technologists showed a greater concentration in lower categories, primarily at level VII

(41%), followed by levels III (12.4%), IV (11.4%), and VI (11.4%). In contrast, higher levels were less represented, such as Distinguished Researcher (5.7%) and Level I (1.9%). This distribution reflects a research population in the process of consolidation. Previous studies have shown that factors such as tenure, H-index, thesis supervision, and scientific productivity are related to higher research classification levels.<sup>27</sup> Therefore, the transition to higher categories requires the progressive accumulation of scientific output, academic leadership, and continuous participation in research.

Early training in researchers is also a relevant aspect for expanding the scientific participation of this profession. Among Peruvian university students, a study reported that only 13 were recognized as RENACYT (National Registry of Science, Technology and Innovation) researchers, of whom 3 (23.1%) were in the health sciences, although some had publications indexed in databases such as Scopus and SciELO.<sup>28</sup> These results highlight the importance of strengthening a research culture from the early stages of professional training.

Finally, the results of this study should be understood within the Peruvian and Latin American scientific landscape, characterized by differences in investment, number of researchers, and knowledge generation capacity. Global investment in R&D increased from 1.71% of GDP in 2015 to 1.92% in 2023, but with marked differences between regions; Europe and North America reached approximately 2.55% of GDP, while other regions show considerably lower values.<sup>19</sup> In this context, strengthening the participation of Medical Technologists in research requires increasing opportunities for scientific training, mentorship programs, project funding, and collaboration between universities and health institutions.

This study has some limitations. First, the identification of research Medical Technologists was carried out using the official

registries of RENACYT and CONCYTEC's CTI Vitae. Therefore, the results represent professionals officially recognized in this system, and the existence of Medical Technologists who conduct scientific research but are not registered in RENACYT cannot be ruled out. Furthermore, by using information from secondary registries, the availability and updating of some data depended on the information recorded by the researchers themselves on the consulted platforms. Finally, due to the cross-sectional design of the study, the results allow us to describe the academic, professional, and scientific characteristics of the registered Medical Technologists, as well as explore associations between variables; however, they do not allow us to establish causal relationships.

The Medical Technologists registered in RENACYT represent a small group within the Peruvian scientific system. Most belong to the area of clinical laboratory and anatomical pathology, work in universities, and are in entry-level categories, demonstrating a research trajectory still in development. These results highlight the need to strengthen research training, postgraduate studies, and scientific development opportunities for Medical Technologists.

## Conclusion

This study provides the first nationwide characterization of the scientific profile of Medical Technologists registered in RENACYT. These professionals represent a small group within the Peruvian scientific system, predominantly working in clinical laboratory science and anatomical pathology, employed at universities, and concentrated in the registry's entry-level categories. The findings highlight the need to strengthen their research training, postgraduate education, and opportunities for scientific development.

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