

# Training and career opportunities for residencies in Hygiene and Preventive Medicine: results of a survey on 39 Italian schools

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## Abstract

**INTRODUCTION:** The Italian National Health Service (SSN) is currently grappling with a complex situation, characterized by a persistent shortage of medical personnel and the divergent aspirations of young medical graduates. Additionally, recent regulatory developments concerning specialist training further contribute to the intricacies of the landscape, calling for a comprehensive analysis of the challenges and opportunities within the sector. This study aims to provide an updated overview of the current placement of medical graduates, residents and specialists in the specific hygiene and preventive medicine (Public Health) field.

**METHODS:** Data on admissions, withdrawals and resignations were obtained from the Ministries of Universities and Health and from the archives of the “Associazione Liberi Specializzandi” (ALS). Information regarding the professional prospects for specialists and residents in the field of Public Health was gathered through a tailored survey conducted by the “Consulta dei Medici in Formazione Specialistica” (Council of Medical Residents) of the Italian Society of Hygiene (SIIt).

**RESULTS:** In 2022, a total of 483 specialization contracts were granted, indicating a decrease of 37% compared to the previous year. Notably, 85 positions (17.6%) remained unallocated or resulted in dropouts. Six months after completing their residency, 1.5% of hygiene residents were still actively seeking employment. On a positive note, 75.4% of fourth-year residents secured contracts under the “Decreto Calabria”. Career opportunities within the Italian SSN have witnessed growth, with a significant proportion of placements in territorial services and hospital medical directorates.

**DISCUSSION AND CONCLUSIONS:** The updating of training programs provided by residency schools and the exploration of innovative approaches are of paramount importance to address the urgent need for high-quality training and to cater to the requirements of the national health system.

## Introduction

The persistent shortage of medical staff in the Italian National Health Service (“Sistema

Sanitario Nazionale, SSN), the management of the post-pandemic phase and the divergent aspirations of young medical graduates and specialists have necessitated in-depth reflection and concrete action in all related sectors. The challenges arising from the effective and efficient reorganization of health organizations must take into account the training of health professionals in general, and especially those who will serve in health directorates, both in hospitals and community settings, such as specialists in hygiene and preventive medicine. As the social, economic, technological, and cultural context evolves, the regulatory framework also adapts, providing a standardized yet comprehensive system of training and employment opportunities.<sup>1</sup>

In this context, the prevailing trend among Italian doctors specialized in Public Health is to pursue careers in administrative and leadership positions within various public and private healthcare organizations. These roles encompass responsibilities in hospitals, local health units, health districts, as well as national and international agencies. Article 1, clause 548-bis of Law No. 145 of 2018, known as the "Decreto Calabria", introduced the possibility of hiring medical residents on fixed-term contracts, with automatic conversion to permanent contracts upon obtaining the specialization title, starting from the third year of the specialization course.

University professors of Hygiene and Public health and the Italian Society of Hygiene, Preventive Medicine and Public Health (SIItI) have always been interested in both the fundamental competencies that a specialist should have acquired at the end of their training<sup>3-6</sup> and the evolving regulations regarding specialty training, professional opportunities and indicators of the attractiveness of training programmes<sup>7-10</sup>.

In 2016, in collaboration with the "Consulta dei Medici in Formazione Specialistica" of the SIItI, a survey was conducted to explore the professional prospects and job satisfaction of a selected group of recently specialized professionals in hygiene and preventive medicine.<sup>11</sup>

Given the significant changes and challenges faced during the subsequent seven years, including the impact of the pandemic and recurrent concerns about the shortage of medical personnel, it became imperative to conduct a follow-up study to evaluate the present status concerning the professional integration of specialist doctors and fourth-year Public Health residents.

The primary objective of this study is to offer an up-to-date perspective and a precise evaluation of the career prospects of professionals in the vital domain of public health, specifically those specializing in hygiene and preventive medicine. The study seeks to comprehend the impact of recent regulatory modifications on their career opportunities and professional contentment, thus providing valuable insights into the current situation within this field.

## Methods

Data regarding admissions, withdrawals, and resignations were sourced from the archives of the "Associazione Liberi Specializzandi" (ALS), which is based on ministerial data.<sup>13</sup>

Additionally, information on the professional outcomes of public health specialists and data on fourth-year residents with contracts under the "Decreto Calabria" were gathered by the "Consulta dei Medici in Formazione Specialistica" of the SIItI through a tailored

survey conducted in collaboration with representatives from the 39 accredited schools. During the data analysis, the number of dropouts in the first semester of the 2022-2023 academic year was combined with the count of unallocated contracts in 2022. This amalgamation was deemed more suitable to highlight potential shortages of specialists and the motivating factors associated with specific regions or areas.

Fisher's test was used to compare different categorical variables. A p-value of less than 0.05 was considered statistically significant. For post-hoc analysis, the Holm-Bonferroni correction was used to adjust the level of statistical significance for p-values less than 0.05 to counteract the increased likelihood of committing type I errors when conducting multiple tests.

Analyses were performed using Python (v. 3.10.9) and the pandas (v. 1.5.3) and SciPy (v. 1.10.1) modules.

## Results

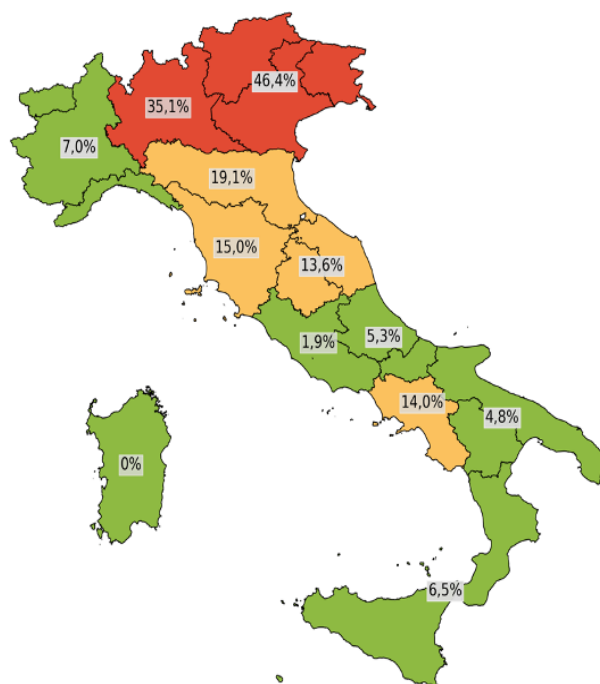
The specialist recruitment system has undergone significant changes in recent years. Notably, there was a remarkable surge in the number of Public Health specialization contracts awarded in the first year, reaching a peak of 761 specialist contracts out of a total of 17,400 in 2021. However, in 2022, the number of contracts experienced a considerable decline by 37%, reducing to 483. This decline was accompanied by a notable increase in unallocated contracts and first-year dropouts.

It is essential to highlight that the decline in 2022 was primarily influenced by the limited availability of qualified candidates, particularly medical and surgical graduates eligible for the profession. This factor played a significant role in shaping the recruitment scenario during that period. The total number of dropouts and unallocated posts for Public Health was 85, representing 17.6% of the total (Table 1). However, the data exhibited regional disparities, with an unexpected loss of 35.1% in the 7 schools in Lombardy and a substantial 46.4% decline in the 4 schools located in the Triveneto region (Verona, Padua, Udine, and Trieste) (Figure 1).

	MIUR Contracts Assigned	Unassigned contracts	Dropouts at six months	Unassigned + dropouts (%)	(2021) (%)
Total Italian Schools	13,000	2,059	728	2,787 (21.4%)	11.2%
Total clinical services area	3,795	898	182	1,080 (28.5%)	12.2%
Total Public Health	483	64	21	85 (17.6%)	10.1%

**Table 1.** Unassigned medical residency contracts and dropouts.

MIUR: Ministry of Education, University and Research. Data refer to 2022 unless otherwise specified.



**Figure 1.** Percentage of lost contracts (unassigned and dropouts) for Public Health Schools (2022).

The response rate to the employment status questionnaires was 100%. Compared to 2016, there has been a significant reduction in the number of Public Health specialists still seeking employment six months after specialization, with a decrease from 24.0% in 2016 to 1.5% in 2023 ( $p < 0.001$ ). Among the 195 fourth-year residents, 147 (75.4%) secured contracts under the "Decreto Calabria." It is worth noting that in 2016, this figure was naturally 0%, owing to the distinct regulations in place at that time.

The professional outcomes of specialists employed six months after obtaining their qualification have undergone significant changes between 2016 and 2023 ( $p < 0.001$ ). A notable rise was observed in the number of young professionals employed in the SSN, both in territorial services such as departments and districts (47.8%, +24.6%,  $p < 0.001$ ), and in hospital medical directorates (35.1%, +20.0%).

The difference in the latter case was near the significance threshold due to the Holm-Bonferroni correction used to maintain the overall probability of type I errors at 5%. Conversely, all other employment options showed a relative decrease, including specialists employed in medical directorates of accredited or non-accredited private institutions (-13.2%,  $p = 0.001$ ), and those choosing academic career paths such as doctoral programs and research fellowships (-12.2%,  $p = 0.006$ ) (Table 2).

	2015	2023	p-value
<b>Status</b>	N=125	N=136	<0,001*
<b>Unemployed</b>	30 (24,0%)	2 (1,5%)	
<b>Employed</b>	95 (76,0%)	134 (98,5%)	
<b>Employment</b>	N=95	N=134	<0,001*
<b>SSN - Territory<sup>1</sup></b>	22 (23,2%)	64 (47,8%)	<0,001 <sup>++</sup>
<b>SSN - Medical Direction</b>	19 (20,0%)	47 (35,1%)	0,017 <sup>+</sup>
<b>Private - Medical Direction</b>	16 (16,8%)	5 (3,7%)	0,001 <sup>++</sup>
<b>University</b>	18 (18,9%)	9 (6,7%)	0,006 <sup>++</sup>
<b>Italian health institutions</b>	12 (12,6%)	3 (2,2%)	0,002 <sup>++</sup>
<b>Foreign health institutions</b>	2 (2,1%)	1 (0,7%)	0,571 <sup>+</sup>
<b>Other</b>	6 (6,3%)	5 (3,7%)	0,532 <sup>+</sup>

**Table 2.** Employment status and career outlets of employed specialists six months after specialization.

<sup>1</sup>: includes departments and districts.

<sup>+</sup>: type of calculation: one-vs-all; <sup>\*</sup>: statistically significant difference.

## Discussion and conclusions

The presented results highlight a notable shift in the context compared to 2016, affecting both general residencies and those in Public Health. However, certain observations raise concerns regarding the recruitment of third- and fourth-year residents through the "Decreto Calabria," involving fixed-term contracts of 24-30 hours per week, within SSN and accredited private institutions. This type of employment raises several critical issues that warrant meticulous evaluation:

- The de facto shortening of the specialization course may pose a risk to the thoroughness and quality of the residents' training. This could potentially lead to a lack of in-depth knowledge in various specialties and a reduction in opportunities to gain valuable experience.
- Difficulties in preserving the schools' leadership role in the training process may arise due to the recruitment process outside established networks.
- Inconsistency in mentoring within health institutions could be a concern, particularly when recruitment occurs beyond established networks.
- The declining attractiveness of academic careers is a worrisome trend that needs to be addressed.
- There may be a shift in the balance between the main training site and the training network, with an increasing proportion of residents being recruited, which can have implications for the overall training experience.

Although the schools have the authority to decline approval of these contracts, our data

indicate that this procedure is not being effectively utilized in the Public Health sector, partly due to pressure from health institutions facing a shortage of staff. However, an effort could be directed towards concentrating on consolidating essential professional activities during the initial two years of the course, a step that many schools are already undertaking.

In terms of professional prospects, the landscape has undergone significant changes compared to 2016, with a notable shortage affecting nearly all clinical and service-related domains. Consequently, the increased recruitment within the SSN comes as no surprise, even if it results in scarcities in other professional areas.

In the current post-pandemic scenario, characterized by severe staff shortages and a substantial influx of junior doctors, who are often co-opted by the Italian National Health Service before completing their natural postgraduate training, the priorities of specialist schools, particularly in Public Health, must be reevaluated. Emphasis should be placed on updating training programs and aligning them with the emerging needs that have arisen during the pandemic.

Consolidating training networks and ensuring an adequate number of qualified mentors to supervise trainees are of paramount importance. Furthermore, considering innovative and targeted training approaches will be crucial until the human resource emergency is effectively addressed. It is anticipated that the crisis in the human resources sector will persist until the end of this decade. Only through appropriate training and special attention to the current and future requirements of the health system can a specialized and competent workforce in Public Health be assured.

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