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Pulmonary rehabilitation facilities and expertise in Italy: the role of cardiorespiratory physiotherapists. A national survey endorsed by ARIR and AIPO

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Dear Editor,

Over the past two decades, the role of the cardiorespiratory physiotherapist (CR-PT) has become increasingly prominent within clinical care pathways, significantly contributing to the management of both acute and chronic respiratory diseases.

Despite this professional expansion, information on the distribution of facilities providing cardiorespiratory rehabilitation and on the clinical competencies effectively performed by CR-PTs remains fragmented and insufficiently systematized.

To address this knowledge gap and promote a shared reflection on the current landscape, ARIR (*Associazione Riabilitatori dell'Insufficienza Respiratoria*) conducted two consecutive nationwide surveys aimed to delineate the current scenario and identify areas of development and critical issues.

The first survey, conducted between January and April 2023, was distributed to public, private, and accredited facilities across all care settings and intensities, with the aim of producing the first "*National Mapping of Cardiorespiratory Physiotherapy Services in Italy*".

The second survey ("*Clinical Practice and Advanced Competencies of Cardiorespiratory Physiotherapists in Italy*") was conducted between March and May 2024 and involved only the facilities that had reported the presence of CR-PTs in the first survey and aimed to further characterize delivered treatments, professional training and competencies, care settings, clinical activities, and patterns of daily and weekly service coverage.

Both surveys were conducted in accordance with CHERRIES guidelines (*Supplementary Paragraph S1*) [1].

The first survey was conducted by scientific Italian Associations ARIR and AIPO (*Associazione Italiana Pneumologi Ospedalieri*) using publicly available addresses and the associations' institutional contact networks and was therefore implemented as an open survey.

Of 850 public and 600 accredited facilities contacted, 410 responses were obtained (*Supplementary Figure 1*) from the public sector (48.2%) and 145 from the accredited sector (24.2%), yielding an overall response rate of 38.3% (555/1450). These response rates are consistent with those typically reported for online surveys in healthcare research [2]. As not all accredited private facilities (*i.e.*, private providers accredited by the Italian National Health Service) provide rehabilitation interventions, accredited-sector coverage was estimated through referral mapping (public-sector respondents reported the main external referral facilities, which were recurrent across responses); based on these reports, accredited-sector responses are estimated to represent ~90% of eligible accredited facilities.

Among respondents, accredited facilities reported a higher prevalence of a dedicated cardiorespiratory physiotherapy team than public facilities [94/145 (64.8%) *vs.* 160/410 (39.0%); two-sided Fisher's exact test, $p<0.001$]. This difference may reflect structural and case-mix differences between settings, with accredited facilities more frequently organized around rehabilitation pathways, whereas public facilities often prioritize acute care (Figure 1).

The collected data revealed wide variability in care settings and clinical competencies, as well as pronounced geographic disparities in service availability, raising concerns about inequitable access to specialized cardiorespiratory physiotherapy care (especially in Southern Italy and the Islands) and supporting targeted strategies to strengthen specialist competencies across settings.

The second ARIR survey focused exclusively on facilities providing cardiorespiratory rehabilitation; it excluded both non-responders from the first survey and centers that did not offer these services. Of the 248 institutions contacted, 91 responded (37%).

Overall, 78% of facilities offer respiratory rehabilitation, and 22% provide cardiac programs, though some cardiac interventions are not delivered by CR-PTs. Service provision is not continuous, with coverage frequently lacking on weekends and holidays (*Supplementary Table 1*). CR-PTs mainly work in intensive care, pneumology units, rehabilitation wards, and outpatient clinics, with a growing, though still limited, presence in emergency departments and home care (*Supplementary Table 2*).

The survey also examined assessment tools and eight major intervention areas (*Supplementary Table 3*). Vital signs monitoring

is nearly universal (93%), and the 6-minute walk test is widely used in both respiratory (85%) and cardiac (90%) services [3]. Conversely, advanced tools such as thoracic and muscle ultrasound remain uncommon (20% and 7%) [4], and even simple measures of cough efficacy are underused (55% in respiratory and 15% in cardiac services) [5].

Across intervention domains (*Supplementary Table 4*), the most frequent practices include airway clearance techniques (particularly positive expiratory pressure systems and cough assistance), early mobilization, strength and endurance training, and a wide range of educational activities. Oxygen therapy is widely used, and physiotherapists play an active role in aerosol therapy, invasive and non-invasive mechanical ventilation, and tracheostomy management.

Regarding autonomy in patient management, physiotherapists report limited direct patient access. Most referrals originate from medical specialists, while referrals from nurses or other non-physician professionals remain uncommon (*Supplementary Table 5*).

The voluntary nature of both surveys and the exclusion of non-responding centers in the second survey introduce selection and geographic representativeness bias, limiting the completeness of the national picture. Although response rates were acceptable, the results cannot be considered representative of the entire Italian context, as data were obtained from only 10 of 20 regions, with responses mainly coming from north-west regions.

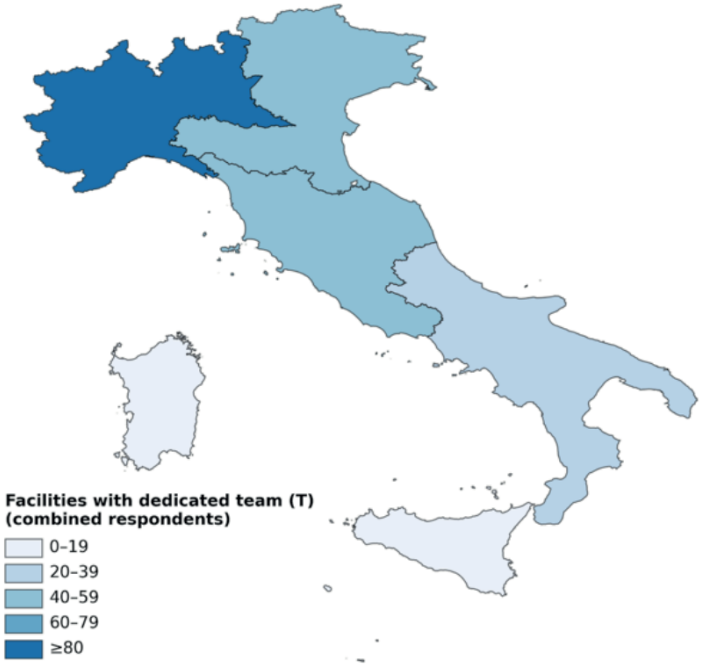
The following considerations represent the authors' perspective, informed by the survey findings, and are intended to support future professional development and policy discussion.

The two surveys enabled a transition from a general overview of critical issues (survey 1) to a more detailed analysis of clinical practices (survey 2). Overall, the results highlight persistent regional disparities and the need to strengthen advanced training for CR-PTs to ensure more homogeneous access to high-quality cardiorespiratory physiotherapy services across Italy. In light of the growing prevalence and impact of chronic diseases, these findings also emphasize the strategic importance of integrating CR-PTs within primary care settings, where early intervention, long-term management, and continuity of care are essential [6-10].

Based on these findings, we call for the formal recognition of cardiorespiratory physiotherapy as a clinical specialty within the Italian healthcare system. The complexity and specificity of interventions delivered across multiple care settings, including intensive acute, chronic, palliative, and pediatric care, support the need for structured career pathways, advanced postgraduate education, and the establishment of national professional standards [11].

Within primary care, CR-PTs could play a complementary role alongside general practitioners, contributing to the management of chronic cardiorespiratory conditions [12], reducing disease burden, and improving patient outcomes through integrated, multidisciplinary care [10]. Promoting greater clinical autonomy for CR-PTs, where appropriate, may improve care integration, continuity, and responsiveness. Establishing a national minimum standard for including CR-PTs on multidisciplinary teams would be a key step toward equity and sustainability within regional health services, particularly in community-based and primary care contexts [13-15].

From a health-system perspective, the observed gap between accredited and public facilities highlights the need for targeted



Macro-area summary – Public

Macro-area	T / N	%
North-West	63 / 112	56.2
North-East	45 / 102	44.1
Central	29 / 79	36.7
South	13 / 91	14.3
Islands	10 / 27	37.0
Total	**160 / 410**	**39.0**

Macro-area summary – Accredited

Macro-area	T / N	%
North-West	32 / 49	65.3
North-East	10 / 16	62.5
Central	30 / 33	90.9
South	16 / 35	45.7
Islands	6 / 20	30.0
Total	**94 / 145**	**64.8**

Macro-area summary – Combined

Macro-area	T / N	%
North-West	95 / 161	59.0
North-East	55 / 118	46.6
Central	59 / 112	52.7
South	29 / 126	23.0
Islands	16 / 47	34.0
Total	**254 / 555**	**45.8**

Coverage (response rate): Public 410/850 (48.2%); Accredited 145/600 (24.2%).

Accredited responses were estimated to cover ~90% of eligible providers.

Figure 1. Dedicated cardiorespiratory physiotherapy teams by macro-area (combined: public + accredited). Shading indicates the absolute number of facilities reporting a dedicated team (T). Tables show T/N (%) for public, accredited, and combined respondents, where N is the number of respondent facilities within each macro-area.

policies to strengthen and standardize specialist competencies in cardiorespiratory physiotherapy, promoting equitable access to these skills across settings, particularly where rehabilitation needs are high, and continuity of care is critical. This would not only help address the growing burden of chronic diseases but also enhance the role and visibility of CR-PTs within the healthcare system.

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Online supplementary material:

Supplementary Paragraph S1. Survey methodology.

Supplementary Figure 1. Distribution of Survey 1 respondents (n=555) across Italian regions, stratified by setting (public vs. *accredited) and by care context (hospital- vs. community-based). Accredited facilities: private providers accredited by the Italian National Health Service (SSN). Community-based facilities: services delivered outside hospital settings (territorial/community care).*

Supplementary Table 1. Weekly and shift coverage by cardiorespiratory physiotherapists – combined cardiac and respiratory settings.

Supplementary Table 2. Main work environments where cardiorespiratory physiotherapists deliver clinical activities, reported separately for respiratory and cardiac pathways.

Supplementary Table 3. Functional assessment activities performed by cardiorespiratory physiotherapists during patient functional assessment, reported separately for respiratory and cardiac pathways.

Supplementary Table 4. Types of interventions delivered as core domains of daily clinical practice, by rehabilitation area.

Supplementary Table 5. Referral source for physiotherapy intake, by rehabilitation area.

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