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The Organizational Structure and Workforce Composition of Prevention Departments in the Triveneto Area: A Cross-Sectional Descriptive Study with a Focus on the Veneto Region

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Abstract

Background: In Italy, Departments of Prevention (*Dipartimenti di Prevenzione*, DPs) are primary organizational units for disease prevention, health promotion, and environmental health. Constitutional decentralization (2001) generated significant regional variability. While national data exist, in-depth regional analyses are lacking. Objectives: To provide a systematic descriptive analysis of organizational structure, governance mechanisms, and workforce composition of DPs in the Triveneto area (Veneto, Friuli Venezia Giulia, Autonomous Provinces of Trento and Bolzano), contextualized within national and international frameworks. Methods: Cross-sectional descriptive study using 2022 Italian Prevention Observatory national survey data. A structured 87-item questionnaire assessed organizational structure, governance, staffing, and quality systems. Results: A total of 10 of 14 DPs participated (71.4% coverage; 5.2 million inhabitants, 87% of Triveneto population). All maintained three mandated core services (Public Health and Hygiene, Veterinary Public Health, and Occupational Health and Safety), employing medians of 35%, 23%, and 14% of staff, respectively. Management Committees were active in 80% of DPs (vs. 77.6% nationally). Quality certification (30%) and institutional accreditation (50%, Veneto only) showed inconsistent implementation. The workforce was predominantly non-executive (65% vs. 67% nationally), reflecting progressive task reallocation. Median staff density: 3235 inhabitants/staff member (vs. 2608 nationally). Conclusions: Participating DPs—predominantly from the Veneto Region—demonstrate comprehensive service coverage and established governance structures, yet face standardization challenges. Findings should be interpreted in light of Veneto overrepresentation (8/10 participating DPs). Alignment with territorial care reforms (Ministerial Decree 77/2022) and National Recovery Plan investments could enhance integration, digital infrastructure, and preparedness capacity.

Keywords: public health organization; health services administration; workforce; health system governance; comparative health systems

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1. Introduction

1.1. Background and Rationale

Health promotion and disease prevention are fundamental pillars of the Italian National Health Service (*Servizio Sanitario Nazionale*, SSN), essential to ensure its effectiveness, equity, and sustainability. Since its establishment in 1978, the Italian SSN has recognized

the centrality of collective prevention, strengthening it through National Health Plans and the definition of Essential Levels of Care (*Livelli Essenziali di Assistenza*, LEA) [1]. Within this framework, public health services play not only technical and operational roles but also strategic ones, contributing to the identification of intervention priorities and the definition of public health policies.

The Departments of Prevention (*Dipartimenti di Prevenzione*, DPs) represent the main organizational units within Local Health and Social Care Authorities (*Aziende Sanitarie Locali*, ASL) dedicated to collective prevention and health protection. Formally introduced with Legislative Decree 502/1992 and consolidated in the 2017 LEA, each DP is an integrated department coordinating multidisciplinary services aimed at collective health protection [2]. They are responsible for a wide range of activities, including prevention of infectious and chronic diseases, vaccination programs, food and occupational safety, veterinary public health, environmental health, and health emergency management. The DP thus serves as an intermediate node between technical–operational and strategic levels, as well as a bridge between the health system and the community.

The COVID-19 pandemic highlighted both the operational centrality of DPs and their structural weaknesses. The crisis amplified pre-existing issues—organizational fragmentation, staff shortages, limited interoperability of information systems, and weak coordination among services—emphasizing the urgent need to rethink the prevention system architecture [3–5]. This rethinking requires organizational models capable of combining flexibility, territorial integration, multidisciplinarity, and managerial robustness.

Another element of complexity lies in marked interregional heterogeneity. The autonomy granted to Regions by the reform of Title V of the Constitution (2001) has generated wide variability in DP organizational and managerial structures, resulting in significant differences in structure, resources, and operational modes [6–8]. This variability is accompanied by inconsistencies in planning, monitoring, and evaluation mechanisms, potentially affecting the equity and quality of services provided.

To provide a systematic and comparable framework of these differences, the Italian Prevention Observatory (*Osservatorio Italiano Prevenzione*, OIP) was established in 2010 to continuously monitor the organizational structures and activities of Italian DPs. The most recent survey, conducted in 2022, updated and expanded previous assessments, collecting standardized data on structural, organizational, and managerial aspects across Italian DPs [9].

1.2. The Triveneto Context and Study Rationale

Within this framework, the Triveneto area represents a particularly interesting context for in-depth organizational analysis. Although these territories share a common national regulatory framework and geographical–institutional proximity, they have developed distinct organizational configurations shaped by autonomous decisions and diverse evolutionary trajectories.

While the 2022 OIP national report provides aggregate national data [9], this study offers the first in-depth regional analysis focusing specifically on the Triveneto area. This analysis is justified by several considerations:

1. Regional specificity: Triveneto territories, while geographically proximate, have exercised their constitutional autonomy differently, resulting in organizational diversity; this warrants systematic documentation to inform governance and policy.

2. Policy relevance: Understanding organizational configurations in this area can inform ongoing reforms, particularly National Recovery and Resilience Plan (*Piano Nazionale di Ripresa e Resilienza*, PNRR) investments [10] and implementation of Ministerial Decree 77/2022 on territorial care models [11].

3. International contextualization: Unlike the national OIP report, this study situates Italian DP organizational models within a broader international landscape, drawing on contextual descriptions of European (France, Germany, UK) and Asian (Japan, South Korea) public health systems as a background reference rather than a systematic comparison.

4. Post-pandemic perspective: The 2022 data provide the first systematic structural assessment after the COVID-19 pandemic, allowing a first structural assessment of organizational configurations in the immediate post-pandemic period.

1.3. Study Objectives

This study aims to:

1. Systematically describe the organizational structure and governance mechanisms of DPs in the Triveneto area based on 2022 data;

2. Characterize workforce composition and distribution across services;

3. Compare Triveneto findings with national benchmarks and identify areas of convergence and divergence;

4. Situate Italian DP organizational models within a broader international landscape, drawing on contextual descriptions of selected public health systems as background reference;

5. Discuss structural implications for health system governance in light of ongoing territorial care reforms, identifying priority areas for future research and policy evaluation.

This is a structural–descriptive study, not a functional or performance evaluation. It focuses on organizational architecture ("who is there and how they are organized") rather than operational outcomes ("what they achieve"). Performance indicators and functional assessments, while important, fall outside the scope of this analysis.

2. Materials and Methods

2.1. Study Design and Data Source

This cross-sectional descriptive study uses data from the 2022 OIP national survey. The OIP, established in 2010, conducts periodic assessments of Italian DPs using standardized instruments to enable longitudinal and comparative analyses.

2.2. Data Collection

Data collection employed a structured questionnaire developed by OIP and validated by a national technical working group. The instrument consisted of 87 questions organized into thematic sections:

- Territorial and demographic characteristics;
- Organizational structure and internal governance;
- Staffing, resources, and equipment;
- Activities and operational areas of services;
- Integration with other healthcare structures;
- Emerging areas (digitalization, emergency management, environmental interactions).

The questionnaire integrated quantitative items (e.g., staffing levels, resources, facilities) with qualitative components (e.g., presence of committees, coordination mechanisms) and subjective assessments (e.g., perceptions of organizational quality). The complete instrument is described in detail in the national OIP 2022 report [9].

Data were collected through an online platform between 7 November 2022 and 1 March 2023, with continuous technical support from the OIP research team. To ensure data quality, internal consistency checks and, when available, cross-validations with institutional sources were performed. In cases of incomplete responses, partial data entered by the

survey closing date were included in the analysis with appropriate documentation of missing values.

2.3. Study Population

The study population comprised all 14 DPs operating in the Triveneto area as of 30 June 2022:

- Veneto Region: 9 DP;
- Friuli Venezia Giulia (FVG) Region: 3 DPs;
- Autonomous Province of Trento (APT): 1 DP;
- Autonomous Province of Bolzano (APB): 1 DP;

Participation was voluntary. All DP directors in the Triveneto area were invited to participate.

2.4. Data Analysis

Descriptive statistical methods were employed. For Veneto Region, given multiple responding units, median values were calculated. For FVG and APT, individual values are reported. For aggregate Triveneto calculations, individual observation units were analyzed separately. In addition to reporting number of participating DPs, we calculated population coverage as the proportion of Triveneto population served by participating DPs.

Data from Triveneto DPs were compared with national survey findings [9]. Data processing was performed using Stata Statistical Software Release 16 (StataCorp LLC, College Station, TX, USA).

3. Results

3.1. Survey Participation and Population Coverage

In the Triveneto area, 10 of 14 DPs participated in the survey (Table 1). The participation rate was 71.4% in terms of number of units, but represented 87% of the Triveneto population (5.2 million of 6.0 million inhabitants).

Table 1. Participation, population served, and territorial characteristics.

Area	Total DPs	Participant DPs	DP Coverage Rate (%)	Population Coverage (%)	Population Served (n) [1]	Territorial Extension (km^2) [1]	Population Density (Inhabitants/km^2)
Veneto	9	8	88.9	94	733,512	2313	317
FVG	3	1	33.3	25	309,400	2275	136
APT	1	1	100	100	542,158	6206	87
APB [2]	1	0	0	0	534,147	7400	72
Triveneto	14	10	71.4	87	579,120	2377	244
Italy	106	60	56.6	46	2480		168

[1] Values for Veneto, Triveneto, and Italy represent median figures across participating DPs within each area; values for FVG and APT represent single-unit observations. [2] APB did not participate in the survey; demographic data are reported for completeness and refer to the total provincial population.

Specific participation by area:

- Veneto: 8/9 DPs (88.9% unit response rate; 94% population coverage)
- FVG: 1/3 DPs (33.3% unit response rate; 25% population coverage)
- APT: 1/1 DP (100% participation)
- APB: 0/1 DP (non-participating)

The limited participation from FVG and the absence of APB mean that findings are predominantly representative of the Veneto Region, a limitation discussed further below.

Unless otherwise specified, findings for FVG and APT reflect single-unit observations and should be interpreted accordingly.

3.2. Organizational Registry and Quality System

Quality certifications and accreditation: less than one-third of Triveneto DPs (30%) reported voluntary quality certification, most frequently ISO 9001:2008 [12] or Accreditation Canada International. Nationally, 22% reported such certifications, predominantly ISO 9001:2015 [13].

Regarding institutional accreditation (regulatory mechanisms activated by some Regions), only Veneto-based DPs reported access to such processes; these accounted for 50% of participating Triveneto DPs. Nationally, 39.7% of DPs reported regional institutional accreditation mechanisms.

Active quality management systems were reported by 60% of Triveneto DPs, though this exclusively reflected Veneto Region implementation. The national proportion was lower (47.4%).

Organizational stability: Most Triveneto DPs (70%) reported organizational configurations unchanged for >3 years as of 30 June 2022, similar to the national proportion (67.3%). Details:

- 7/8 Veneto DPs: stability >3 years;
- 1/8 Veneto DPs: configuration defined 1–3 years prior;
- FVG DP: structure defined <1 year before survey;
- APT DP: stability 1–3 years.

Structural mergers: Seven Triveneto DPs provided information on structural mergers since 2012, reporting a median of three merged units (nationally: median of two units).

Complete data are presented in Table 2.

Table 2. Quality systems, certifications, and organizational stability.

Area	Quality Certification (Presence)	Active Institutional Accreditation (Presence)	Quality Management System (Presence)	Organizational Stability	Structural Mergers Since 2012, (n) [1]
Veneto	37.50%	100%	100%	7/8 DPs >3 years 1/8 DPs 1–3 years	3
FVG	No	No	No	<1 years	*
APT	No	No	No	1–3 years	*
Triveneto (n = 10)	30%	50%	60%	70% >3 years	3
Italy (n = 60)	22%	39.70%	47.40%	67.3% >3 years 41.7% 1–3 years	2

[1] Values for Veneto, Triveneto and Italy represent the median calculated among DPs reporting information. * Data not available for single-unit observations (FVG, APT).

3.3. Internal Governance Mechanisms

Management Committees: Steering committees (*Comitati di Direzione*) were present in 80% of Triveneto DPs (8/10), aligned with the national figure (77.6%). These committees serve as internal governance bodies for strategic coordination, operational planning, and cross-service integration. Active in:

- 7/8 Veneto DPs;
- 1/1 FVG DP;
- Not reported for APT DP.

Annual meeting frequency: 8 ± 7.1 meetings in Triveneto vs. 6.9 ± 5.3 nationally, suggesting relatively active governance engagement.

Committee composition: This generally included representatives of medical management, veterinary management, and prevention technicians. Prevention technicians were particularly well represented in Triveneto (consistently among top three professional categories), unlike nationally where their inclusion was less common (18%).

Regional Prevention Plan (RPP) coordination: Responsibility for coordinating regional prevention plan implementation was located within:

- DP Directorate: 60% (vs. 56.9% nationally);
- Hygiene and Public Health Service: 30% (vs. 20.7% nationally);
- Food and Nutrition Hygiene Service: 10% (included within the "others" category, 22.4%, at national level).

Dedicated organizational structures for RPP coordination were present in 50% of Triveneto DPs vs. 37.9% nationally.

Complete data are reported in Table 3.

Table 3. Steering committees and Regional Prevention Plan coordination.

Indicator	Triveneto	Italy
Presence of a Management Committee	80% (8/10 DPs) [1]	77.60%
Annual Committee meetings (mean)	8 ± 7.1	6.9 ± 5.3
Predominant composition of the Committee	Medical management, veterinary management, prevention technicians	Medical management, veterinary management
Prevention technicians among main Committee members	Yes (frequently among the top three professional categories)	Only in 18% of cases
RPP coordination located within:	DP's Directorate (60%), Hygiene and Public Health Service (30%), Food and Nutrition Hygiene Service (10%)	DP Directorate (56.9%), Hygiene and Public Health (20.7%), others (22.4%)
Presence of a dedicated structure for RPP coordination	50% (5/10 DP)	37.90%

[1] Active in 7/8 Veneto DPs and 1/1 FVG DP; not reported for the Autonomous Province of Trento.

3.4. Service Organization and Coverage

Core services: All participating DPs maintained the three fundamental services mandated by national regulations (D.Lgs. 229/1999):

1. Public Health and Hygiene (*Igiene e Sanità Pubblica*);
2. Veterinary Public Health (*Sanità Pubblica Veterinaria*);
3. Occupational Health and Safety (*Prevenzione e Sicurezza Ambienti di Lavoro*).

These services employed the largest workforce shares, with median proportions of 35%, 23%, and 14%, respectively, of total staff.

Additional services (Table 4): Presence of other functional units showed greater variability:

- Health Promotion: 100% (vs. 89% nationally);
- Epidemiology and Data Analysis: 80% (vs. 81% nationally);
- Cancer Screening: 100% (vs. 73% nationally);
- Forensic Medicine: 90% (vs. 60% nationally);
- Sports Medicine: 70% (vs. 71% nationally);
- Public Health Laboratories: 40% (vs. 48% nationally), including services delivered through inter-organizational agreements or external entities (e.g., Regional Environmental Protection Agencies, ARPA).

Table 4. Availability of additional services.

Service	Veneto	FVG	APT	Triveneto	Italy
Health Promotion	100%	Yes	Yes	100%	89%
Epidemiology and Data Analysis	100%	No	No	80%	81%
Cancer Screening	100%	Yes	Yes	100%	73%
Forensic Medicine	87.50%	Yes	Yes	90%	60%
Sports Medicine	75%	Yes	No	70%	71%
Public Health Laboratory [1]	37.50%	No	Yes	40%	48%

[1] Including services delivered through inter-organizational agreements or external entities (e.g., Regional Environmental Protection Agencies).

3.5. Workforce Composition and Distribution

Workforce data were available for 8 of the 10 participating DPs; two Veneto DPs did not provide complete staffing information by the survey closing date and were therefore excluded from workforce analyses.

Overall workforce (Table 5): Total professionals per DP ranged 131–385 (median 179 vs. 160 nationally); median staff age was 46 years (vs. 50 nationally).

Table 5. Workforce composition and density.

Region/Area	DPs with Available Data	Non-Executive Staff (%)	Executive Staff [1] (%)	Total Staff [2]	Inhabitants per Staff Member (n)	Km^2 per Staff Member
Veneto	6	64	36	198	3705	11.7
FVG	1	72	28	154	2009	14.8
APT	1	75	25	160	1515	38.8
Triveneto	8	65	35	179	3235	13.3
Italy	43	67	33	160	2608	15.5

[1] Executive staff includes both healthcare executives (e.g., medical directors, veterinary directors) and non-healthcare executives (e.g., administrative directors), as per OIP classification. [2] Values for Veneto represent median figures across 6 DPs with complete workforce data; values for FVG and APT represent individual DP values. Triveneto row represents the median across all 8 DPs with available data. Italy row represents the median across 43 DPs with available data (source: OIP 2022 national report [9]).

Executive vs. non-executive staff: Non-executive staff (technical, administrative, and allied health professionals) comprised 65% of the workforce (median), similar to national figures (67%). Executive staff (healthcare and non-healthcare managers) represented 35% of the workforce. Data on staff in active service show a slight decrease in the executive proportion compared to pre-pandemic levels (from 33.6% in January 2019 to 31.6% in June 2022).

Workload indicators:

- Inhabitants per staff member: median 3235 (Triveneto) vs. 2608 (national)
- km^2 per staff member: median 13.3 (Triveneto) vs. 15.5 (national)

Staff distribution by service: Due to incomplete sub-regional data, aggregate Triveneto–national comparisons are presented (Table 6). Median staff per service:

- Public Health and Hygiene: 104 (Triveneto) vs. 47 (national);
- Veterinary Services: 50 vs. 49;
- Occupational Health and Safety: 30 vs. 23;
- Food Safety and Nutrition: 20 vs. 20.

The notably higher Public Health and Hygiene staffing in Triveneto likely reflects the overrepresentation of larger Veneto DPs in the sample rather than a true organizational difference.

Environmental Health and Epidemiology and Population Health show a median of zero dedicated staff in Triveneto, despite the latter being formally present in 80% of participating DPs (Table 4). This apparent discrepancy reflects the fact that professionals working in these areas are frequently shared with other services—particularly Public Health and Hygiene—and are not reported as exclusively dedicated to these units in the survey instrument.

Table 6. Median staff per service.

Service	Triveneto	Italy
Public Health and Hygiene	104	47
Veterinary Services	50	49
Occupational Health and Safety	30	23
Food Safety and Nutrition	20	20
Environmental Health	1	3
Epidemiology and Population Health	1	4
Other services	20	19

Professional composition: Key professional categories, expressed as median number per DP, are presented in Table 7:

- Specialists in Hygiene and Preventive Medicine: 21 (Triveneto) vs. 11 (national);
- Veterinarians: 27 vs. 31;
- Environmental and Public Health Technicians: 57 vs. 51;
- Administrative Staff: 31 vs. 29;
- Healthcare Assistants: 20 vs. 10;
- Occupational Medicine Specialists: 3 vs. 5.

Table 7. Professional composition by role (median number of professionals per DP).

Professional Role	Triveneto	Italy
Executive healthcare staff		
Specialist in Hygiene and Preventive Medicine	21	11
Specialist in Occupational Medicine	3	5
Specialist in Food Sciences	0	1
Post-graduate Medical Resident	0	0
Veterinarian	27	31
Other Executive Healthcare Professional	2	3
Non-executive healthcare staff		
Dietitian	1	1
Environmental and Public Health Technician	57	51
Occupational Psychologist	0	0
Healthcare Assistant	20	10
Aid Personnel	0	1
Other Healthcare Professional	0	18
Technical and administrative staff		
Executive Administrative Officer	1	1
Administrative Staff	31	29
IT Specialist	0	0
Statistician	0	0
Sociologist	0	0
Other Professional (Non-Healthcare)	0.5	1

All values represent medians across participating DPs with available data (Triveneto: n = 8; Italy: n = 43, source: OIP 2022 [9]). A value of "0" indicates that the median number of professionals in that category was zero among participating DPs. This may reflect either true absence of the professional figure or non-reporting by individual DP; the two conditions cannot be distinguished based on available aggregate data. "Other healthcare professional" (Triveneto = 0 vs. Italy = 18): the marked difference likely reflects incomplete sub-regional reporting rather than true absence of this category in Triveneto DPs. The value of 0.5 for "Other professional (non-healthcare)" in Triveneto represents the median of values ranging between 0 and 1 across participating DPs.

3.6. Perceived Priorities for Future Development

Eight Triveneto DPs provided responses on the perceived importance of emerging thematic areas using 5-point Likert scales (1 = minimum importance; 5 = maximum importance) [14]. Given that 8 of 10 responding DPs belong to the Veneto Region, the priority rankings reported below predominantly reflect Veneto organizational perspectives; findings for FVG and APT are based on single observations.

Mean scores and standard deviations are reported for Likert-scale items, as these are more appropriate than medians for summarizing ordinal rating data across multiple units. Results are presented in Table 8:

Table 8. Perceived importance of emerging thematic areas (Likert scale 1–5).

Area	Mean	SD	Median	IQ Range
Preparedness, response, and management of public health emergencies	4.6	0.6	5	4–5
Interaction with other territorial services	4.5	0.9	5	4–5
National Prevention System for Health, Environment and Climate	4.5	0.8	5	4–5
Individual and collective prevention through innovative technologies	4.4	0.8	5	4–5
Control and regulatory functions (e.g., Food and Nutrition Hygiene Services, Forensic Medicine)	4.2	1	4	4–5

1. Preparedness, response, and management of public health emergencies: 4.6 (SD 0.6);
2. Interaction with other territorial health services: 4.5 (SD 0.9);
3. National Prevention System for Health, Environment and Climate (SNPS): 4.5 (SD 0.8);
4. Individual and collective prevention through innovative technologies: 4.4 (SD 0.8);
5. Control and regulatory functions: 4.2 (SD 1.0).

All areas received high ratings (median 5, IQR 4–5), with emergency preparedness scoring highest, reflecting post-pandemic organizational priorities.

4. Discussion

This study provides the first in-depth post-pandemic assessment of DP organizational structure and workforce in the Triveneto area, contextualizing findings within national and international frameworks. Key findings collectively point to a system with solid structural foundations—universal core service coverage and active internal governance—but an uneven implementation of supplementary functions and quality standardization. Workforce composition reflects a broader national shift toward technical–operational roles, while regional heterogeneity—partly attributable to limited participation from FVG and APB—warrants cautious generalization. Notably, emergency preparedness and territorial integration emerged as strategic priorities, consistent with post-pandemic policy trajectories.

The presence of Steering Committees in most DPs (80% vs. 77.6% nationally), meeting frequently (8 ± 7.1 times/year), suggests established internal governance mechanisms for strategic coordination and cross-service integration. The higher representation of prevention technicians in Triveneto committees (consistently top-three professional category vs. 18% nationally) may reflect stronger technical input into governance decisions.

However, quality management systems and accreditation show uneven implementation. While 60% reported active quality systems, this exclusively reflected the Veneto Region. Only 30% had obtained voluntary certifications. Institutional accreditation, where

regionally mandated, was accessible only in Veneto (50% of the Triveneto sample). This heterogeneity suggests differing regional approaches to process standardization. Whether these differences translate into inequities in service delivery and accountability remains an open question that warrants longitudinal investigation.

The concentration of active quality management systems and institutional accreditation pathways exclusively within Veneto-based DPs reflects, in part, a regional policy choice. The Veneto Region has historically pursued accreditation as a systemic governance tool, embedding it within its regional health planning framework and allocating dedicated resources for implementation. The divergence that emerged from this study illustrates how constitutional autonomy—while enabling regional innovation—can simultaneously generate structural asymmetries in process standardization, with potential implications for cross-regional benchmarking and service comparability. Organizational stability (70% with configurations > 3 years) provides continuity but may also reflect limited organizational innovation; impacts on service delivery and efficiency remain unclear and warrant longitudinal evaluation.

The predominance of non-executive staff (65%) and slight reduction in managerial proportion compared to 2019 reflects a national trend of "task reallocation" [15,16]. This shift enhances technical–professional and administrative capacity to support increasing volumes of control, surveillance, and health promotion activities. Whether this trend affects strategic leadership capacity is a hypothesis that future organizational studies should explore. The workload indicators (median 3235 inhabitants/staff member vs. 2608 nationally) suggest a relatively higher per-capita workload in Triveneto, though this may partially reflect the larger median population served per DP (579,120 vs. 417,220 nationally).

Service-specific staffing shows Public Health and Hygiene as the largest service (median 104 staff in Triveneto vs. 47 nationally), though this difference likely reflects sample composition rather than true organizational difference, given the Veneto overrepresentation.

Critically, while present in 80% of DPs, epidemiology and data analysis units showed heterogeneous configurations. These units are essential for surveillance, data-driven planning, and evidence-based priority-setting—functions proven crucial during the pandemic [17,18]. Strengthening and standardizing these analytical capacities represents a priority development pathway.

The recent regulatory framework offers leverage to address identified critical issues:

(i) Ministerial Decree 77/2022 [11] defines models and standards for territorial care, emphasizing integration among services and proximity. For DPs, this entails a closer interface with new territorial structures (Community Health Centers, Territorial Operations Centers, Community Hospitals) and reinforced prevention, health promotion, and protection functions within inter-professional and intersectoral frameworks.

(ii) The PNRR (Mission 6—Health) [10] activates investments in proximity networks and digital infrastructures, which, if directed toward public health functions, can accelerate process standardization, information interoperability, and capacity building—provided clear governance frameworks and shared outcome metrics are established [19].

Both frameworks point toward a model of territorial public health that integrates prevention, promotion, and care. How DPs can best position themselves within this evolving architecture—and whether current structural configurations support that role—are questions that future research and policy evaluation should address. To provide broader context—rather than a systematic comparative analysis, which falls outside the scope of this study—the following observations situate Italian DPs within international frameworks. European models show varying integration and autonomy levels: in France, *Agences Régionales de Santé* provide strategic regional coordination, but operational prevention remains

fragmented across actors, with higher centralization than Italian models [20,21]. In Germany, *Gesundheitsämter* represent local public health cornerstones with strong territorial anchoring and direct prevention/emergency responsibility, but without systematic hospital integration [22,23]. In the United Kingdom, recent reforms divided responsibilities between local authorities (prevention/health promotion) and UK Health Security Agency (preparedness/threat response), separating local delivery from national coordination [24,25]. North American systems (US Local Health Departments, Canadian Public Health Units) display strong operational autonomy and decentralization, with variable standardization and accountability levels [26,27]. In Asia, Japanese Public Health Centers (*Hokenjo*) constitute primary territorial structures performing multidisciplinary functions (infectious disease control, food/environmental safety, maternal–child health, mental health), serving ~300,000 inhabitants per center—comparable to Italian DPs in scale and scope [28–30]; South Korean Public Health Centers played crucial pandemic roles in surveillance, vaccination, testing/tracing, and risk communication, characterized by business continuity planning emphasis and coordinated local–central response [31,32].

These observations highlight a recurring tension between local autonomy and central coordination that characterizes public health systems across different national contexts. The extent to which Italian DPs share or diverge from these organizational patterns in terms of functional outcomes remains a question for future comparative research based on harmonized indicators.

Limitations

Several limitations warrant consideration:

(a) Incomplete geographic coverage: While 10/14 DPs participated (71.4%), population coverage was 87%. However, marked overrepresentation of Veneto (8/10 DPs) means findings predominantly reflect Veneto organizational models, limiting generalizability to the FVG Region and APB.

(b) Structural focus: This is a descriptive structural analysis, not a functional or performance evaluation. Organizational architecture is documented, but relationships between structure and outcomes (vaccination coverage, screening uptake, workplace safety indicators) are not assessed.

(c) Self-reported data: Potential for reporting biases, though internal consistency checks and institutional cross-validation were performed where possible.

(d) Cross-sectional design: Data reflect a specific time point (June 2022), preceding full implementation of DM 77/2022 and PNRR investments. Longitudinal studies are needed to assess organizational evolution.

(e) Missing data: DPs with incomplete workforce data were excluded from workforce analyses (Section 3.5); for other sections, partial data available at the survey closing date were included, with missing values documented accordingly.

Despite these limitations, the study's strengths include the use of a validated national instrument enabling systematic comparisons with national benchmarks, the high representativeness of the Veneto Region, and the provision of international contextual background absent from aggregate national reports.

5. Conclusions

DPs in the Triveneto area exhibit solid core service coverage and established governance structures (Steering Committees, RPP coordination), while facing challenges in quality system standardization, accreditation implementation, and analytical capacity development (epidemiology units).

The workforce composition (predominantly non-executive staff, with a trend towards progressive task reallocation) reflects a broader national evolution toward enhanced technical–operational capacity. Whether this trajectory affects strategic leadership capacity warrants monitoring through future longitudinal studies.

Regional heterogeneity, particularly between Veneto and other Triveneto territories, underscores ongoing tension between constitutional autonomy and standardization imperatives. Alignment with DM 77/2022 territorial care models and PNRR digital infrastructure investments represents strategic opportunities to enhance integration and interoperability; the extent to which these investments will strengthen preparedness capacity remains to be assessed as implementation progresses.

Priority development pathways include: (i) strengthening intelligence functions (epidemiology, data analytics) [33,34]; (ii) consolidating quality systems and accreditation [35]; (iii) institutionalizing preparedness planning [36]; (iv) fostering territorial integration with community-based care structures [37]; and (v) investing in workforce development and retention strategies [38].

Building on longstanding prevention traditions, these pathways can position DPs to navigate ongoing health system transformations and contribute to the sustainability of collective health protection services.

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