

Understanding Italian and European citizens' knowledge, trust and awareness about One Health: a transdisciplinary approach

Chiara Fanali*, Nicola Ferrigni**

The “One Health” (OH) approach highlights the interconnectedness of human, animal, and environmental health, emphasizing collaboration across disciplines to address complex global challenges such as pandemics, climate change, and antimicrobial resistance. Despite its academic and institutional prominence, OH remains poorly understood by the public, with limited awareness and trust in its feasibility. This study, based on a CAWI survey of 1,500 European citizens, reveals significant knowledge gaps, with only 15% recognizing OH as a label and 24% understanding the concept when explained. While interest in OH is high, trust in its implementation lags behind. Citizens' perceptions also favor tangible over systemic benefits. Bridging this gap requires clearer communication, supportive policies, and actionable strategies to translate OH from theory into practice, fostering its integration into daily life and global health governance.

Keywords: One Health; Transdisciplinary Approach; Survey; Citizens; Knowledge; Awareness.

Introduction and Theoretical Framework

“One health”, “Global health”, “Planetary health” are new words for ancient concepts or new approaches to ancient issues? Several high-risk international infectious disease events related to human health over the past several decades such as zoonotic diseases and viruses have led to the need to rethink the research approach and management policies on human health.

The WHO acknowledges One Health as a critical approach to preventing and addressing global health threats, particularly zoonotic diseases, antimicrobial resistance, and environmental health risks. It actively fosters collaboration across human, animal, and environmental health sectors through initiatives like the One Health Joint Plan of Action (2022-2026), developed in partnership with FAO, UNEP, and WOAHA.

* Università Campus Bio-Medico, Roma. c.fanali@unicampus.it

** Università degli Studi della Toscana. nicola.ferrigni@unitus.it

The term “One Health” (OH) – first appeared at the beginning of the 21st century (Queenan *et al.*, 2017; Gibbs, 2014) – represents an innovative, interdisciplinary paradigm emphasizing the intrinsic connections between human, animal, and environmental health. This holistic vision reflects a growing awareness that health is not an isolated entity but the result of complex interactions between natural ecosystems, socio-economic systems, and global policies. Thus, over the last 25 years, this concept has gained increasing prominence in academic discourse, particularly as a framework for addressing critical challenges such as pandemics, climate change, antimicrobial resistance, and food security.

The origins of the concept are widely debated, especially within medical and health literature, which tends to polarize around two contrasting perspectives (Michalon, 2020). On one side, several scholars (e.g., Rushton *et al.*, 2018; Mantovani, 2013; Zinsstag *et al.*, 2005) argue that OH reflects an approach rooted in Antiquity and widely practiced since the Middle Ages. The physician Hippocrates (460 BCE-367 BCE) recognized the connection between public health and a healthy environment in his script *On Airs, Waters and Places* (Evans, Leighton, 2014).

On the other side, some contend that OH is a radically novel framework, developed in response to unforeseen contemporary challenges, with no historical precedents. Chien (2013), in particular, highlights how the global health crises of the late 1990s exposed the scientific and organizational limitations of international health systems, fostering the development of a collaborative approach among institutions such as WHO, FAO, and OIE. This cooperation helped diffuse institutional tensions and foster shared symbolic legitimacy.

Recently, a reconciliatory interpretation of these opposing views has emerged, stating how the OH approach embodies an integrated strategy capable of grasping risks while formulating comprehensive, systemic solutions to safeguard health and prevent potentially irreversible harm.

Over the years, the OH framework has fostered collaboration across a wide range of disciplines – including human and veterinary medicine, chemistry, ecology, economics, and the social sciences – to develop integrated and sustainable solutions. To this purpose, several scholars (Zinsstag *et al.*, 2023; Berger-Gonzalez *et al.*, 2020; Min *et al.*, 2013) have emphasized the need to move beyond the traditional notion of “interdisciplinary research”. While interdisciplinarity aims to synthesize and harmonize connections between disciplines into a coordinated and coherent whole, a transdisciplinary approach goes further. In fact, it transcends traditional boundaries by focusing on the interrelationships within, across and beyond disciplines, building upon a

shared conceptual framework (Rosenfield, 1992; Choi, Pak, 2006; Alvargonzález, 2011).

However, as Zinsstag *et al.* (2023, p. 347) highlight, a transdisciplinary approach to OH «cannot be understood and addressed without an engagement between scientists and non-academic actors from society and government». This necessitates integrating academic research with the empirical experience and practical knowledge of local stakeholders, administrators, and community members.

This is a critical turning point. Despite its growing prominence in academic and institutional contexts, OH has struggled to establish itself in public discourse and common understanding. This difficulty stems from several factors: on the one hand, the nature of the paradigm demands a deep comprehension of the interconnectedness of sectors often perceived as distinct, posing a significant challenge for effective science communication. On the other hand, the urgency of issues such as planetary health often clashes with a fragmented public narrative that tends to prioritize immediate health crises over long-term prevention (Roh *et al.*, 2016; Poole *et al.*, 2024).

Additionally, cultural resistance to redefining health as more than a solely human concern remains a significant barrier. Historically, public health policies have been shaped by anthropocentric perspectives, emphasizing human well-being without accounting for the interconnectedness with other ecosystems. This perspective is reinforced by religious and philosophical traditions that place humans at the core of moral and ethical considerations. Furthermore, economic and industrial interests often favor a human-centric health model, as systemic changes may challenge established power structures and require significant financial investments.

Media narratives further exacerbate this gap, as public discourse tends to emphasize immediate human health crises rather than long-term ecological health considerations. Therefore, the fragmentation of information, amplified by media polarization (Bentivegna, Boccia Artieri, 2021), further limits the public's ability to grasp the relevance of the OH approach. This creates a substantial gap between the conceptual advances of the paradigm and its capacity to influence individual and collective behaviors meaningfully, only partially mitigated by the experience of the pandemic (Ghebreyesus, 2021; Sannella, 2024).

1. Aims and Methodology

Based on these premises, this article presents the main findings of an empirical study aimed at measuring and understanding, from a comparative perspective, European citizens' knowledge, trust, and awareness regarding the OH approach¹.

The hypothesis this study seeks to test is threefold²:

- H1. among European citizens, the level of knowledge about the OH approach appears highly heterogeneous due to both geographical factors (as the triple transition³, within which the OH framework is situated, progresses at varying speeds across EU member states) and generational differences (younger individuals may exhibit a greater openness toward the approach compared to older generations).
- H2. These variables also influence the level of trust European citizens express in the feasible effective implementation of the OH approach within national contexts, potentially leading to further fragmentation of the overall landscape.
- H3. Partly due to the pandemic experience, awareness of the potential of the OH approach tends to polarize around two distinct dimensions: either as a mere antidote to the dangers posed by global crises or as a comprehensive, systemic solution aimed at safeguarding the health and preventing potentially irreversible harm.

From a methodological point of view, this study adopts a mixed methods approach (Cresswell, 2015; Amaturò, Punziano, 2016), to provide a qualitative interpretation of the results of a quantitative empirical analysis. To this

¹ This study takes shape within the broader framework of the 1° National Report on OH (2024), promoted and coordinated by Campus Bio-Medico and carried out in collaboration with the Piepoli Research Institute. A second edition of the National Report was released in February 2025.

² The selection of geographical factors and generational differences as key determinants of knowledge and trust in One Health is based on empirical patterns identified during the research preliminary phase, consisting of 22 in-depth interviews with key informants. Geographic disparities highlight variations in policy implementation, public health infrastructure, and environmental challenges across regions. Meanwhile, generational differences affect exposure to educational curricula and shift narratives on health interconnectivity, shaping openness to transdisciplinary models like OH.

³ The triple transition refers to the simultaneous ecological, digital, and health transitions that are shaping contemporary public policies and governance frameworks. These interconnected shifts influence how societies approach sustainability, technological advancements, and integrated health strategies, highlighting the relevance of the OH framework in addressing global challenges.

end, a structured questionnaire with fixed and predetermined response options was designed (Corbetta, 2015), also thanks to a collaborative and trans-disciplinary interaction between social and life sciences. The survey was subsequently administered using the CAWI (Computer-Assisted Web Interviewing) method to a sample of 1,500 European citizens⁴. The sample was representative of the reference population in terms of gender (male, female), age group (18-34 years, 35-54 years, 55 years and over), and territorial distribution (Italy, France, Germany, Poland, Spain, and the UK)⁵. The questionnaire was administered in October 2023.

The empirical analysis of the three hypotheses was developed around three specific research questions:

RQ1. What is the level of knowledge about the OH approach among European citizens?

RQ2. Is there a correlation between the level of knowledge about the OH approach and the level of trust in its actual feasibility within individual countries?

RQ3. What awareness do European citizens have of the benefits that could result from an OH approach?

2. Research findings

2.1. Knowledge and understanding

At first, the survey aimed at exploring the level of knowledge and understanding among European citizens regarding the OH. The first finding from

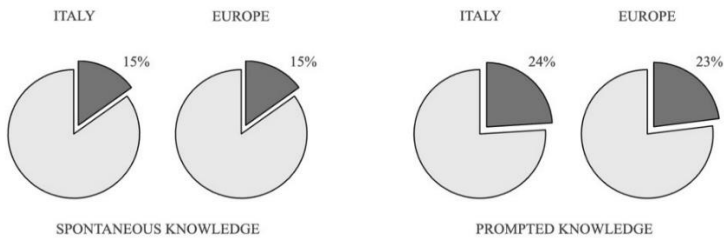
⁴ The choice of the CAWI technique is driven by the need for broad geographical coverage, as well as for efficient and standardized data collection, while also reducing operational costs and interviewer bias. Additionally, this method enhances response sincerity, as participants complete the questionnaire independently without external pressure. It also allows for the integration of visual content to facilitate the understanding of complex concepts like OH. The administration of the CAWI survey was entrusted to the Piepoli Research Institute, which ensures sample representativeness through its panel of respondents, making this methodological approach particularly suitable for comparative studies on a European scale.

⁵ The sample was designed to ensure balanced representativeness across the surveyed European countries; however, Italy holds a stronger weight in the analysis, with 500 interviews conducted there, while the remaining 1,000 were distributed across Spain, France, Germany, Poland, and the United Kingdom. This distribution reflects both methodological and practical considerations, ensuring robust insights while maintaining a comparative perspective. Any potential impact of this difference is carefully accounted for in the interpretation of the results.

the analysis of responses highlights the need to differentiate between the two dimensions of OH as a *label* and as a *concept*.

When respondents are asked whether they have ever heard of OH, only 15% (both at the European and national levels) respond positively. Conversely, when the concept is described rather than only mentioned as a label, the percentage of knowledge rises to 24% among Italian respondents and to 23% among foreign ones. On the one hand, this reveals a gap between spontaneous and prompted knowledge; on the other hand, it is undeniable that overall knowledge of the phenomenon remains limited (Fig. 1).

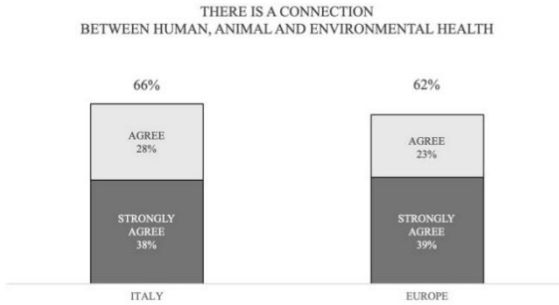
Fig. 1 – Level of knowledge.



In our view, the knowledge gap between OH as a *label* and as a *concept* may arise from multiple socio-cultural influences. Education plays a crucial role, as OH is often absent from school curricula or presented in a highly specialized academic context, limiting its accessibility to the general public. Additionally, media representations tend to focus on crisis-driven narratives, framing OH reactively rather than as a proactive, integrated health approach. Institutional communication further contributes to this gap, as policies and initiatives frequently use OH terminology without clearly translating its implications into tangible public health actions. Furthermore, cultural attitudes towards environmental and animal health vary across societies, shaping how individuals perceive the interconnectedness of health systems and, consequently, their trust in OH as a viable framework.

This limited understanding of the phenomenon is, however, counterbalanced by a high level of agreement regarding the existence of a connection between human, animal, and environmental health: 66% of Italian respondents and 62% of foreign ones declare they “agree” (38% and 39%, respectively) or “strongly agree” (28% and 23%, respectively). Once again, the data reveal a broader openness in Italy compared to other European countries included in the survey (Fig. 2).

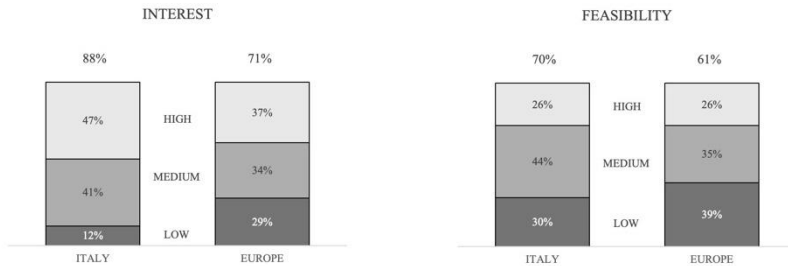
Fig. 2 – Level of agreement.



2.2. Interest and feasibility

Shifting the focus from knowledge and understanding to interest and feasibility, a dual gap immediately emerges (Fig. 3).

Fig. 3 – Levels of interest and feasibility.



In absolute terms, respondents express an overall level of interest in the OH model that overall exceeds 70% (specifically, 88% among Italians and 71% among foreigners). Notably, the percentage of those who find OH “very interesting” (47% and 37%, respectively) surpasses that of those expressing moderate interest (41% and 34%, respectively, responding “interesting”). Conversely, when investigating the perceived likelihood of the model’s implementation, the perceptions tend to settle at lower levels, both generally (70% in Italy, 61% abroad) and relatively (only about 1 in 4 respondents considers the implementation of the model to be “very likely”).

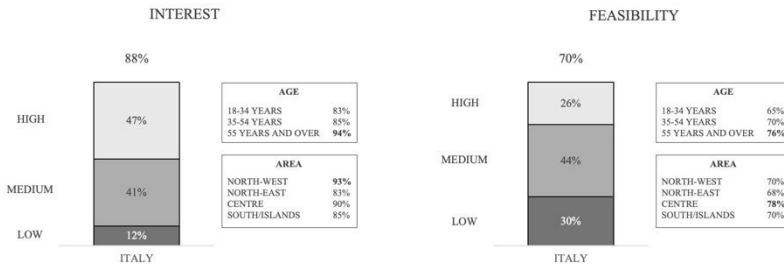
In relative terms, the above-mentioned greater openness among Italian respondents towards the OH remains evident: 88% of Italians overall consider the OH model either “interesting” (41%) or “very interesting” (47%), compared to 71% abroad (34% and 37%, respectively).

A similar trend is confirmed when respondents evaluate the perceived likelihood of implementing the model. A total of 70% of Italian respondents view implementation as “likely” (44%) or “very likely” (26%), whereas abroad, the overall percentage stands at 71% (specifically, 34% and 37%, respectively).

Focusing specifically on the Italian context, it is worth highlighting some significant findings that emerge when the data is broken down by age and geographical area. The percentages related to both interest in the OH model and its perceived feasibility increase overall among the older population segments, reaching 94% (compared to the average of 88%) and 76% (compared to 70%) among individuals aged 55 and above.

Conversely, greater heterogeneity is observed concerning geographical differences: respondents from the Northwest show the highest level of interest in the model (93%), while the most skeptical are those from the Northeast (83%). Regarding the feasibility of implementation, confidence levels are highest in Central Italy (78%), while the Northeast once again stands out as the most “lukewarm” area (68%) (Fig. 4).

Fig. 4 – Levels of interest and feasibility, focus Italy.

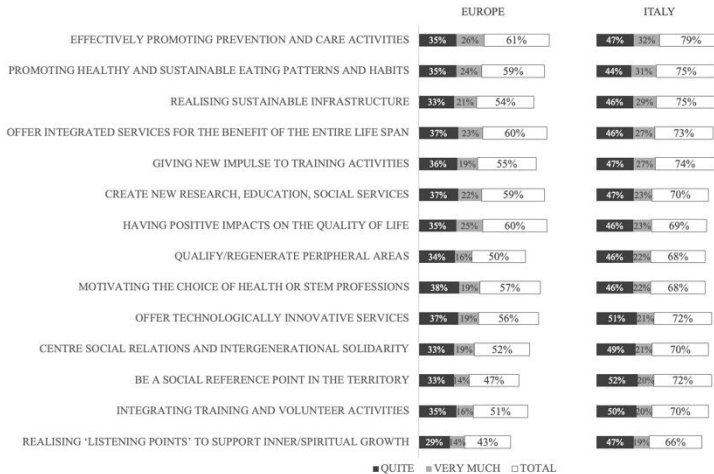


2.3. Awareness and trust

The awareness and trust issues were primarily investigated about the functionality of the OH model. To this end, a 4-level Likert scale was adopted, and for each response item – corresponding to different operational

areas of OH – respondents were asked to provide a quali-quantitative answer (“not at all”, “a little”, “quite”, “very much”) (Fig 5).

Fig. 5 – Awareness and trust.



Firstly, a stronger trust in the potential of the OH model emerges among Italian citizens: the combined percentages of “very much” and “quite” exceed 60%, whereas abroad, negative peaks as low as 43% are also recorded.

Secondly, respondents’ answers reveal a substantial convergence, with the benefits of OH being primarily associated with prevention and care. This area stands out among both Italian citizens (79%) and abroad (61%). Next, a strong perception of the OH-sustainability link emerges, with no major discrepancies between Italy and abroad in terms of adopting healthy and sustainable eating habits (75% and 59%, respectively). However, Italian respondents show a greater openness toward the development of sustainable infrastructure (75% compared to 54% abroad).

Other dimensions follow, including a long-term approach (73% of Italians and 60% of foreigners believe OH ensures integrated services throughout life) and significant impacts on quality of life (69% and 60%, respectively).

Finally, compared to foreign respondents, Italian citizens express notably higher levels of trust in OH’s potential in areas such as education and research (74% and 70%, respectively), innovation (72%), social relationships and solidarity (72% and 70%, respectively), and volunteering (70%).

Discussions and Conclusion

Data resulting from the survey demonstrated the importance for improved, more effective, and clearer communication regarding the significance of the OH concept, as well as its implementation into concrete actions. The limited and under-informed public debate on OH is reflected in the relatively restricted awareness and understanding of the approach. This is evident both in terms of familiarity with the concept and citizens' ability to associate the label "One Health" with the interdependence between human health and the health of other ecosystems. On one hand, the research confirms the initial hypothesis – namely, the existence of a knowledge gap. On the other hand, the bivariate analysis of respondents' answers does not support the presence of differences based on variables such as age or geographic area. The data reveal no significant variations in knowledge, either positively or negatively, across age groups, nor do Italian respondents demonstrate higher or lower levels of knowledge about OH compared to their counterparts in other European countries.

This lack of knowledge among citizens highlights the urgent need for stronger communication and information efforts, aimed at framing the concept of OH within citizens' daily experiences while encouraging the use of the term "One Health" explicitly. Strengthening communication about OH becomes even more critical considering that, when prompted to express their support for a model integrating human, animal, and environmental health, citizens exhibit a high level of agreement. This underscores their recognition of the potential benefits of this approach.

Regarding the second hypothesis, the research reveals an additional gap: the discrepancy between public interest in OH and citizens' confidence in its practical feasibility. Overall, while there is widespread and significant interest in OH – particularly pronounced among Italian respondents compared to those in other European countries – this interest is not matched by a corresponding level of trust in its implementation. In Italy, as in the rest of the surveyed European countries, OH is perceived as a highly advantageous approach but one that is challenging to realize in practice.

Looking specifically at the Italian context, the relevance of age as a variable stands out: older generations appear more inclined to encompass the OH model and view its implementation as more feasible, while younger citizens may have more reservations. In our view, this greater openness – both in terms of interest and perceived feasibility – among older citizens is linked to a factor we will soon discuss, namely the domains where the OH model is

seen as particularly functional. Indeed, citizens widely recognize that prevention and care are strongly associated with the principles of the OH approach.

While the knowledge gap surrounding OH can be addressed through more effective communication strategies, the “recipe” for strengthening citizens’ perception of OH as a transition from a good-in-theory model to one that is functional in practice involves several interconnected factors. These include: the adoption of public policies that facilitate the implementation process of OH; the strengthening of intergenerational dialogue and collaborative governance to sustain awareness-raising efforts; finally, the development of technologies and infrastructure that translate the OH concept into tangible services that citizens can experience in their daily lives.

The final research hypothesis focuses on the awareness of the different areas of OH’s applicability. Its objective is to understand whether and how, in citizens’ perceptions, OH emerges as an “antidote” to the dangers posed by global crises, or rather because of its nature as a comprehensive, systemic solution designed to safeguard health and prevent potentially irreversible harm.

Data reveal a perception – once again more pronounced among Italian respondents – of a wide range of domains where the OH approach is seen as advantageous. These domains span healthcare, sustainability, education, research, solidarity, and behavior, with the promotion of activities related to health prevention and care ranking at the top of the list, without notable differences between Italy and the rest of Europe.

An interesting finding from the study, partially linked to the previously mentioned hypothesis, is the stronger tendency among respondents to associate the functionality of OH with concrete, tangible contexts and situations (from healthcare to sustainability). Conversely, more intangible dimensions, such as solidarity or inner/spiritual growth, while acknowledged, tend to rank lower. This suggests that the full transition of OH from an “antidote” to a “systemic solution” has not yet been fully realized. This gap can be traced back to the two earlier research hypotheses: the knowledge gap and the limited trust in OH’s complete feasibility.

In conclusion, the findings of this study reinforce the importance of bridging the gap between theoretical awareness and practical adoption of the OH approach. The data highlight a clear divide between public interest and trust in implementation, pointing out the necessity for improved communication strategies, policy integration, and interdisciplinary collaboration. While existing literature often focuses on institutional adoption (Zinsstag *et al.*, 2023;

Queenan *et al.*, 2017), our results reveal a stronger need for direct citizen engagement to foster a more inclusive OH framework.

Nevertheless, this study has some limitations. The cross-sectional nature of the survey restricts the ability to detect evolving trends in OH awareness over time. Additionally, while the sample is representative of European citizens, national policies and cultural attitudes toward health may differ significantly beyond the surveyed countries. Future research should explore longitudinal trends and expand comparative analysis to include non-European contexts, providing a more comprehensive understanding of the global perception of One Health.

Finally, it's noteworthy to point out that this study also underscores the need for academic institutions to continue investigating, through transdisciplinary approaches like the one adopted in this study, the real capacity of individual citizens to embrace strategies aligned with the OH model – ensuring these do not remain merely theoretical constructs.

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