

Cultural participation of older adults in the digital era: Expanding access or deepening the divide?

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Abstract

Purpose – This article examines the relationship between onsite and online cultural participation among older adults in Italy. Specifically, it investigates whether online cultural consumption complements or substitutes traditional forms of participation and whether these patterns differ by age and gender.

Design/methodology/approach – The analysis is based on original survey data collected in 2025 from a representative sample of Italians aged 60 and over. Four cultural activities are considered: museum visits, theatre attendance, classical music concerts and opera, and other music concerts. The determinants of onsite and online participation are estimated jointly using bivariate probit models that account for the correlation between the two decisions. The specification includes measures of cultural capital, economic conditions, health status, time constraints and accessibility.

Findings – The results suggest that onsite and online cultural participation are complementary rather than alternative forms of engagement. Cultural capital and familiarity with digital technologies are positively associated with both modes of participation. Health and economic constraints are more relevant for onsite participation, while online participation depends more strongly on digital access and Internet use. Additional analyses reveal substantial heterogeneity across age and gender groups, with the oldest respondents facing the greatest barriers to online participation.

Originality/value – The article contributes to the literature by analyzing onsite and online cultural participation within a common empirical framework. Using original survey data on older adults, it provides new evidence on the role of cultural capital and digital inclusion in shaping cultural engagement in later life.

Keywords Cultural participation, Older adults, Digital divide, Cultural capital, Bivariate probit

Paper type Research article

1. Introduction

According to the World Social Report 2023, the number of individuals aged 65 and over is expected to rise from 761 million in 2021 to 1.6 billion by 2050, more than doubling in less than thirty years. [United Nations \(2023\)](#) estimates further suggest that, in Western countries, people over 65 will outnumber those under 25 by mid-century. In Italy, the trend is even more pronounced: [Istat \(2025\)](#) reports that on January 1st, 2024, there were already two elderly

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people for every young person, and if current dynamics persist, the ratio will reach one to three by 2050.

The demographic transition has placed older adults at the center of political and social debate. Once viewed primarily as passive recipients of welfare, whether because of health limitations or financial vulnerability, they are increasingly recognized as active participants in contemporary society (Super, 2020; Vlandas *et al.*, 2021). The challenge is no longer confined to providing care but extends to creating the conditions for their full participation in cultural, social and economic life. In this perspective, ageing is reframed not as a burden, but as a potential driver of innovation and inclusion (Lipp and Peine, 2022; Wang, 2025).

Within this broader shift, cultural participation has become an area of growing attention. Numerous studies highlight its positive impact on well-being, from greater happiness and better family relationships to improved quality of leisure time and a stronger perception of the value of cultural activities (Finn *et al.*, 2025; Fiorillo and Ofria, 2025; Carella and Misuraca, 2025; Ghenta *et al.*, 2022; Biondo *et al.*, 2024). More recently, the spread of digital platforms has added a new dimension, expanding the range of opportunities to access culture beyond traditional formats (Radermecker, 2021; Cellini and Cuccia, 2025). Yet this evolution raises a central question: can digital technologies truly expand cultural access for older adults?

The answer is not obvious. While digital platforms have the potential to overcome physical and mobility-related barriers, they also require digital skills, confidence and resources that are unevenly distributed among older adults. Existing evidence suggests that these constraints become more binding at advanced ages and among individuals with lower education or care responsibilities (Almeida-Meza *et al.*, 2025). Digitalization may therefore expand opportunities for some while reinforcing exclusion for others, making its overall effect on cultural participation an empirical question.

This article focuses on the relationship between onsite and online cultural participation in later life, asking whether digital access complements traditional participation or acts as a substitute, and whether these patterns differ systematically across age and gender groups. Understanding this relationship allows us to examine how digital and physical modes of participation interact within individuals, rather than treating them as independent choices.

The empirical analysis focuses on four types of cultural consumption: exhibitions, museums or archaeological sites; theatre or dance performances; classical music concerts and opera; and other music concerts. These activities represent core domains of institutionalized culture (Ateca-Amestoy, 2008; Reeves, 2015) and differ in formality, cost and physical accessibility, making them particularly suitable for studying participation among older adults. They also have clear digital counterparts (e.g. virtual museum visits, streamed theatre performances, online concerts), enabling a coherent comparison between onsite and online modes (Ateca-Amestoy and Castiglione, 2023; Cellini and Cuccia, 2025).

Using original survey data collected in February 2025, the analysis examines onsite and online cultural participation among older adults in Italy, a country that provides a particularly informative setting given its rapid demographic ageing and uneven diffusion of digital skills across cohorts. The data allow us to observe how socio-demographic and economic characteristics, cultural capital, time and health constraints and cultural services accessibility shape different modes of participation, and whether online opportunities complement or substitute traditional cultural practices.

Methodologically, we estimate a bivariate probit model with onsite and online participation as dependent variables, allowing for correlation between the two decisions. Interaction terms for gender (male and female) and age (below and above 75 years old) capture heterogeneity across subgroups. By modelling the two participation decisions jointly, we account for shared unobserved factors that may influence both modes and avoid biased inference on complementarity or substitution.

The contribution of the article is twofold. First, it provides new evidence by combining detailed information on both onsite and online participation with socio-demographic and economic characteristics, cultural capital, time and health constraints and cultural services

accessibility, filling a gap in the literature that has so far only partially addressed the digital dimension in later life (Radermecker, 2021; Ateca-Amestoy and Castiglione, 2023; Cellini and Cuccia, 2025). Unlike existing studies, which typically examine onsite and online participation separately, this article analyzes the two forms jointly within a unified empirical framework, allowing for a direct comparison of participation modes and their individual-level determinants. Second, by identifying the characteristics associated with online cultural participation among older adults, the article provides empirical evidence on the factors that shape digital inclusion and cultural engagement in later life.

The rest of the article is organized as follows. Section 2 provides a brief review of the literature on consumption among older adults, while Section 3 describes the model and the empirical strategy guiding the analysis. Section 4 presents the survey data and Section 5 illustrates the findings regarding onsite versus online cultural consumption. Section 6 explores heterogeneity by introducing interactions with gender and age. Final remarks are offered in Section 7.

2. Literature survey

Empirical research documents a systematic decline in cultural participation with age, alongside strong stratification by education, health and socioeconomic status (Ghenta *et al.*, 2022). Older adults participate less frequently in cultural activities than younger cohorts, and participation gaps widen among individuals with lower educational attainment, poorer health and mobility constraints (Keaney and Oskala, 2007; Reeves, 2015; Goulding, 2018). Rather than reflecting the direct effects of ageing, these patterns are typically seen as the accumulated outcome of inequalities over the life course. From this perspective, cultural participation is determined primarily by the social and economic conditions that enable or constrain access to cultural life, rather than individual preference alone (UNESCO, 2012).

In this literature, cultural participation is often linked to cultural capital, understood as a set of durable resources shaping tastes, competencies and access to legitimate cultural practices (Bourdieu, 1986). While this framework was not originally developed to study ageing or digital contexts, subsequent work shows that cultural capital continues to influence participation patterns in later life, interacting with education, health and social constraints (Reeves, 2015; Goulding, 2018). From this perspective, cultural engagement in later life reflects persistent differences in accumulated resources rather than contemporaneous changes in time availability.

Health conditions are among the main obstacles that can prevent or discourage cultural engagement among older adults. Keaney and Oskala (2007) argue that time availability is not a key factor for seniors; instead, poor health, limiting disabilities, lack of social networks and limited transportation access are more significant. Fluharty *et al.* (2021) identify predictors of nonparticipation, including gender, dissatisfaction with ageing and the need for assistance in daily activities. In this regard, recent studies also stress the strict correlation between education and impairment in activities of daily living among older adults in European countries (Almomani and Al-Masaeid, 2025).

When shifting the focus to online consumption, the presence of a technological divide emerges as a major barrier to access. In this sense, digital participation requires specific skills and competencies that interact with existing cultural resources, rather than simply extending access to those already engaged in cultural activities. Data from the UK Office for National Statistics (2019) confirm a strong generational digital divide: individuals over 65 represent the largest share of non-Internet users, with more than half of all nonusers aged over 75. Access methods also differ by age, with mobile and on-the-go usage dropping sharply among older cohorts. Yates *et al.* (2015) identify age as the strongest predictor of digital access, though socioeconomic status also plays a significant role. In this perspective, digital inequalities reinforce existing disparities in the conditions that enable participation, rather than constituting an entirely separate barrier (UNESCO, 2012). Evidence for Italy specifically

points in the same direction. The Eurobarometer 2025 surveys on cultural participation document persistent gaps between older and younger adults in access to cultural venues and digital content across EU member states. For Italy, the 2023 Censis report confirms that older cohorts remain the most underrepresented among regular Internet users, and that digital engagement among seniors is strongly correlated with educational attainment and prior familiarity with technology.

Importantly, the digital divide among older adults is not limited to Internet availability but also reflects disparities in digital skills, literacy and confidence. A growing literature shows that older individuals may have access to digital infrastructure but lack the competencies required to search for, evaluate, and engage with online cultural content (van Deursen and Helsper, 2019; Hargittai *et al.*, 2019). From an economic perspective, digital access should therefore be understood as a multidimensional resource that adds to pre-existing inequalities in education and accumulated cultural capital.

Existing evidence on online cultural participation is fragmented across countries and dimensions of access. Studies from Northern and Western Europe emphasize the role of digital skills and lifelong learning (van Deursen and van Dijk, 2019), while others highlight stronger inequalities related to education and income (Wilson-Menzfeld *et al.*, 2025; Bergantino *et al.*, 2026). Other contributions show that digital access depends on the quality of connection, type of device and ability to navigate platforms (Robinson *et al.*, 2020).

Advances in ICT have also reshaped how cultural goods are produced and consumed. Using U.S. data, Ateca-Amestoy and Castiglione (2023) examine museum attendance and digital engagement, finding a partial trade-off between onsite and online participation. The COVID-19 pandemic further intensified these dynamics (Beaunoyer *et al.*, 2020). Bakhshi *et al.* (2023) show that the pandemic accelerated online cultural consumption, lowering traditional barriers but also highlighting inequalities linked to digital skills and access. Cellini and Cuccia (2025) document gradual and still limited substitution between onsite and online participation in the pandemic in reference to the overall Italian population.

While this literature emphasizes the importance of digital skills and confidence, such dimensions are rarely measured consistently in surveys of older populations. For this reason, the present analysis uses Internet availability and familiarity with its use as necessary, though not sufficient, conditions for online participation.

Despite the extensive body of work, research on onsite cultural participation and studies of digital engagement have largely developed in parallel, often relying on different data sources and conceptual frameworks. As a result, we still lack empirical evidence on whether digital participation complements, substitutes or reshapes traditional forms of cultural engagement among older adults, and on how long-standing inequalities in cultural capital interact with digital access. The measurement of cultural participation itself remains an open methodological challenge. As the UNESCO (2012) handbook makes clear, capturing the full range of cultural engagement, from attendance at established venues to informal and digitally mediated forms of participation requires survey instruments that go beyond the traditional indicators available in most national datasets. The present analysis works within the constraints of existing data while acknowledging this limitation explicitly. In what follows, we address this gap by integrating these elements into a joint empirical framework that directly compares onsite and online participation and links both to individual characteristics accumulated over the life course.

3. Model and empirical strategy

In line with the literature, the empirical analysis examines both onsite and online participation, treating cultural engagement as a discrete choice shaped by socio-demographic and economic characteristics, cultural capital and key constraints, including time, health and accessibility of cultural services. The influence of these factors may differ across consumption modes (online vs. onsite) and cultural types (museums, theatre, classical music and other concerts). The

model also accounts for observable and unobservable individual heterogeneity. Some individuals are likely to display a systematically higher propensity to engage in cultural activities, reflecting durable tastes and competencies not fully captured by standard covariates. Accounting for this latent heterogeneity is essential, as participation is observed along two dimensions, onsite and online, which may reflect a common underlying orientation toward cultural engagement. For this reason, onsite and online participation are modelled jointly rather than separately.

We expect cultural capital to increase participation in both modes, consistent with Bourdieu's (1986) framework, which views it as a durable resource shaping engagement across contexts rather than a feature tied to a specific form of consumption. Economic constraints are expected to reduce participation, although online modes may be relatively less affected. Time constraints also matter, as cultural activities compete with alternative uses of time. Health limitations are likely to reduce physical participation more strongly than online engagement. Finally, accessibility operates differently across modes: online participation depends on digital infrastructure and familiarity, whereas onsite participation is constrained by physical distance and the geographical accessibility of cultural venues.

Following Gutierrez-Navratil *et al.* (2024), we model the decision to consume onsite and online cultural goods using a bivariate probit specification. The approach allows us to account for the possibility that the two decisions are interdependent, sharing unobserved determinants, which may interact with the same long-run cultural resources that predict onsite participation (Ragnedda and Ruiu, 2020; Robinson *et al.*, 2020). We therefore treat onsite and online participation as conceptually distinct outcomes, while allowing them to be statistically interdependent through shared unobservables.

For each cultural consumption k , let y_k^O be a binary variable equal to 1 if the respondent consumed the good online at least once in the past 12 months, and y_k^T equal to 1 if the same good was consumed onsite. These observed outcomes are linked to latent variables y_k^{O*} and y_k^{T*} :

$$y_k^{O*} = X_i' \beta_k^O + S_i' \gamma_k^O + \varepsilon_{ik}^O$$

$$y_k^{T*} = X_i' \beta_k^T + S_i' \gamma_k^T + \varepsilon_{ik}^T$$

where X_i contains demand-side variables and S_i includes supply-side variables capturing accessibility of cultural opportunities.

The disturbances ε_{ik}^O and ε_{ik}^T are assumed to follow a bivariate normal distribution with zero means, unit variances (as an identification restriction) and correlation ρ_k :

$$\begin{pmatrix} \varepsilon_{ik}^O \\ \varepsilon_{ik}^T \end{pmatrix} \sim N \left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho_k \\ \rho_k & 1 \end{pmatrix} \right)$$

The correlation parameter ρ_k captures the extent to which unobserved factors jointly influence onsite and online participation for the same cultural activity. Within the proposed framework, a positive and significant ρ_k is interpreted as evidence that the two participation modes are linked through shared cultural resources or motivations, consistent with a view of digital engagement as complementary to traditional cultural practices rather than independent from them.

The model is estimated by maximum likelihood. To ensure valid inference even under potential misspecification of the error distribution, robust standard errors are reported.

We then extend the analysis by exploring heterogeneity across gender and age. Interaction terms are introduced to examine whether the determinants of onsite and online participation differ between men and women, and between individuals below and above the age of 75 [1]. This distinction is particularly relevant for our setting because the mechanisms differ across participation modes: onsite cultural consumption is more directly exposed to physical

4. Data

The analysis is based on an original survey carried out in February 2025 on onsite and online cultural participation among older adults. The survey was enriched with detailed information on socio-demographic and economic characteristics, time use, health and skills. It was funded under the PNRR project TOCCPE (Teaching-driven Opportunity in Cultural Consumption Patterns of the Elderly). The survey was conducted by a specialized polling company using the Computer Assisted Telephone Interviewing method among individuals aged 60 and over. The sample was designed to be representative of the Italian population in terms of gender, age group, macro-area of residence, education level and the size and altimetric zone of the municipality of residence (see [Online Appendix](#)).

To ensure the validity and comparability of the measures, we relied on questions used in official surveys whenever possible. For digital consumption, we referred to items from the Eurobarometer survey (EU, 2025) and the 2023 Censis report “*The New Phase of Digital Life in Italy*” (Censis, 2023). For cultural consumption, we relied mainly on ISTAT’s multi-purpose household surveys, such as “*Aspects of Daily Life*” and “*Citizens and Leisure Time*.” We also developed several original questions to capture technological familiarity and cultural competencies among older adults.

Table 1 presents descriptive statistics for onsite and online cultural participation by type. Onsite participation is considerably more widespread. Over the past 12 months, 21% of respondents visited a museum, 16% attended theatre, 12% went to a classical concert and 6% attended other concerts, typically two to three times. Online participation is much more limited: only 2% reported a virtual museum visit, 3% streamed theatre, 4% accessed classical concerts online, and 3% other concerts. Online engagement was generally sporadic, rarely exceeding six occasions.

We draw a profile of consumers accounting for the usual socio demographic characteristics: age, *age*; gender, *gender*; cohabitation status, *single*. Economic constraints are proxied by the dummies capturing the presence of credit constraints, *credit* and the university degree, *university*, as a proxy of income. University captures also cultural capital informally acquired, while cultural capital informally acquired is proxied by an index based on three knowledge questions concerning sculpture, award-winning Italian actors and composers of ballet music, *expertise*. More precisely, respondents were asked to identify: (1) which artists are known for their sculptures (Antonio Ligabue, Arnaldo Pomodoro, Mario Merz, Caravaggio, Rembrandt); (2) which Italian actors or actresses have won an Academy Award (Marcello Mastroianni, Alberto Sordi, Roberto Benigni, Anna Magnani, Claudia Cardinale) and (3) which composers are known for their ballet scores (Stravinsky, Mozart, Verdi, Wagner, Tchaikovsky). For each question, an “I don’t know” option was provided. A response is coded as “correct” if the individual identifies at least one correct artist within the proposed category. In line with Ateca-Amestoy (2008) competences and familiarity with artistic forms are indeed understood as key determinants of demand. We also include a dummy variable capturing the absence of books at home, *no_book*, a standard proxy for cultural capital (Evans *et al.*, 2010; Bedard and Dhuey, 2006; Ammermueller and Pischke, 2009) and the frequency of Internet use, *Internet*, to capture familiarity with technology as a form of cultural capital necessary to access online cultural consumption. We account for time constraints by including variables measuring hours devoted to childcare, *care_children* and adult care, *care_adults*. We use a dummy capturing bad health status to account for health constraints. To reflect local online and onsite cultural consumptions accessibility, we include a measure of the share of households without ADSL access in the municipality of residence, *no_adsl* and a dummy capturing residence in small municipalities, *small_city*.

Table 1. Descriptive statistics for the dependent variables

	Onsite	Standard deviation	Online	Standard deviation
	Mean		Mean	
<i>Museums</i>				
Never	0.79	0.41	0.98	0.14
One time	0.05	0.21	0.01	0.10
2–3 times	0.07	0.26	0.01	0.08
4–6 times	0.06	0.24	0.00	0.05
7–12 times	0.02	0.13		
>12 times	0.01	0.11		
<i>Theatre</i>				
Never	0.84	0.37	0.97	0.17
One time	0.04	0.20	0.01	0.10
2–3 times	0.07	0.25	0.01	0.10
4–6 times	0.03	0.16	0.01	0.07
7–12 times	0.02	0.12		
>12 times	0.01	0.09	0.00	0.06
<i>Classical music</i>				
Never	0.88	0.32	0.96	0.19
One time	0.04	0.20	0.01	0.10
2–3 times	0.04	0.20	0.01	0.12
4–6 times	0.02	0.15	0.01	0.08
7–12 times	0.01	0.10	0.00	0.05
>12 times	0.01	0.07	0.00	0.06
<i>Other concerts</i>				
Never	0.94	0.24	0.97	0.17
One time	0.02	0.15	0.01	0.09
2–3 times	0.03	0.17	0.01	0.10
4–6 times	0.01	0.08	0.01	0.08
7–12 times	0.00	0.06	0.00	0.05
>12 times	0.00	0.03	0.00	0.03

Note(s): The table reports the frequency of participation in online and onsite cultural activities (museums, theatre, classical music concerts and other concerts) among individuals aged 60 and over in the last 12 months. Museums: Visits to exhibitions, museums or archaeological sites; Theatre: Theater or dance performances; Classical music: Classical music concerts, opera; Other music concerts: all music concerts excluding classical music concerts and opera

Source(s): Authors' own work

Table 2 presents the descriptive statistics for the explanatory variables used in specifying our econometric model to estimate the demand for cultural consumption.

The empirical specification is explicitly linked to the theoretical framework. Each block of covariates is introduced to capture a distinct mechanism affecting the choice between onsite and online cultural participation. Table 3 makes this structure explicit by mapping theoretical predictions to their empirical counterparts, clarifying how the model identifies complementarity or substitution between modes and tests the role of cultural capital, health limitations, economic constraints and accessibility.

5. Results

Table 4 presents the results of the bivariate probit model across the four categories of cultural consumption. The econometric analysis was performed using the software Stata 19.5. The analysis begins with onsite consumption and is followed by online consumption.

Table 2. Descriptive statistics for the independent variables

	Mean	Standard deviation	Min	Max
<i>male</i>	0.45	0.50	0	1
<i>age</i>	73.07	8.87	60	97
<i>single</i>	0.32	0.47	0	1
<i>university</i>	0.09	0.29	0	1
<i>credit</i>	0.53	0.50	0	1
<i>expertise</i>	1.43	1.02	0	3
<i>no_book</i>	0.09	0.29	0	1
<i>internet</i>	0.46	0.50	0	1
<i>care_children</i>	6.58	12.31	0	70
<i>care_adults</i>	7.11	13.36	0	56
<i>health</i>	0.27	0.44	0	1
<i>no_adsl</i>	0.55	0.50	0	1
<i>small_city</i>	0.12	0.32	0	1

Note(s): The Table 2 reports the descriptive statistics of the variables used in the econometric model to estimate the demand for cultural consumption, encompassing both demand-side aspects (socio-demographic profile, education, economic conditions, cultural expertise) and supply-side elements (municipality size and ADSL availability)

Source(s): Authors' own work

Table 3. Testable implications and empirical proxies

Testable implication	Heterogeneity by modes	Variable(s)
Complementarity vs substitutability	Observed and unobserved factors drive both modes of consumption	correlation coefficient <i>rho</i>
Economic constraints	Economic constraints reduce cultural consumption, though online modes are generally more affordable than onsite ones	<i>university, credit</i>
Cultural capital	Consistent with Bourdieu (1986), higher cultural capital (education and expertise) increases participation in both modes	<i>university, expertise, no_book, Internet</i>
Time constraints	Care duties can subtract time from cultural activities	<i>care_adult, care_children</i>
Health constraints	Poor health significantly reduces physical participation but does not constrain online consumption	<i>health</i>
Accessibility	Limited accessibility constrains both online and onsite cultural consumption	<i>no_adsl, small_city</i>

Note(s): The table links the theoretical mechanisms to the variables and parameters used in the econometric specification for onsite and online cultural participation

Source(s): Authors' own work

The bivariate probit estimates indicate elements of complementarity between online and onsite consumption across all cultural categories considered. In line with our model predictions, cultural capital, measured by *expertise*, *no_books* and *Internet*, is significantly associated with both modes of participation. Although the individual coefficients vary across domains, the three variables are jointly significant at the 10% level in all cases. The *Internet* variable likely reflects not only an individual's familiarity with digital technologies, as it was assumed in our frame, but also a broader disposition toward curiosity and an active lifestyle. Finally, the positive and significant correlations between the error terms in the estimated models for onsite and online consumption indicate that unobserved factors, such as personal

Table 4. Biprobit results

	Museums b/se	Theatre b/se	Classical music b/se	Other concerts b/se
<i>Onsite</i>				
male	0.098 (0.102)	-0.038 (0.107)	0.057 (0.111)	-0.062 (0.143)**
age	-0.007 (0.007)	-0.006 (0.007)	-0.000 (0.008)	-0.023** (0.011)
single	-0.012 (0.118)	-0.230* (0.128)	-0.036 (0.132)	0.135 (0.169)
university	0.556*** (0.159)	0.284* (0.167)	0.634*** (0.168)	0.569*** (0.189)
credit	-0.237*** (0.110)	-0.205* (0.113)	-0.256*** (0.123)	-0.332** (0.163)
expertise	0.179*** (0.054)	0.049 (0.055)	0.142*** (0.059)	-0.048 (0.076)
no_book	-0.544*** (0.262)	-0.710*** (0.325)	-0.885*** (0.415)	-0.133 (0.338)
internet	0.644*** (0.120)	0.377*** (0.129)	0.133 (0.138)	0.470*** (0.185)
care_children	-0.006 (0.004)	-0.004 (0.004)	0.001 (0.004)	-0.003 (0.006)
care_adults	-0.004 (0.004)	0.012*** (0.004)	-0.005 (0.004)	0.005 (0.005)
health	-0.417*** (0.141)	-0.272*** (0.137)	-0.302*** (0.154)	-0.534*** (0.224)
small_city	0.007 (0.110)	-0.060 (0.110)	-0.238** (0.119)	0.140 (0.154)
no_adsl	0.165 (0.156)	-0.270 (0.186)	0.035 (0.194)	-0.046 (0.232)
intercept	-0.768 (0.574)	-0.640 (0.593)	-1.198* (0.660)	-0.146 (0.848)
<i>Online</i>				
male	0.414* (0.217)	0.306 (0.190)	0.411** (0.175)	0.541*** (0.203)
age	0.013 (0.016)	0.007 (0.013)	0.007 (0.012)	0.007 (0.012)
single	-0.938** (0.382)	-0.126 (0.229)	0.176 (0.190)	-0.123 (0.229)
university	0.151 (0.277)	0.236 (0.230)	0.207 (0.229)	0.252 (0.242)
credit	-0.805*** (0.295)	-0.238 (0.198)	-0.111 (0.184)	0.041 (0.193)
expertise	0.244** (0.113)	0.299*** (0.109)	0.218** (0.089)	0.096 (0.098)
no_book	0.321 (0.382)	0.054 (0.371)	-0.188 (0.386)	-4.994*** (0.237)
internet	0.413 (0.265)	0.555*** (0.190)	0.713*** (0.200)	0.981*** (0.258)
care_children	0.003 (0.007)	0.008* (0.004)	-0.002 (0.006)	0.006 (0.006)
care_adults	-0.012 (0.008)	-0.012 (0.008)	0.006 (0.005)	0.003 (0.006)
health	-0.089 (0.300)	-0.141 (0.264)	-0.004 (0.227)	-0.220 (0.261)

(continued)

Table 4. Continued

	Museums b/se	Theatre b/se	Classical music b/se	Other concerts b/se
small_city	0.360 (0.273)	-0.148 (0.272)	-0.354 (0.267)	0.131 (0.272)
no_adsl	-3.847*** (1.344)	-3.538*** (0.939)	-3.487*** (0.896)	-3.626*** (0.944)
intercept	0.414* (0.217)	0.306 (0.190)	0.411** (0.175)	0.541*** (0.203)
athrho	0.490*** (0.143)	0.095 (0.126)	0.392*** (0.118)	0.521*** (0.147)
rho	0.454 (0.114)	0.095 (0.125)	0.373 (0.102)	0.478 (0.114)
Wald test (<i>p</i> -values)				
H0: rho = 0	0.0006	0.4504	0.0009	0.0004
Onsite H0: expertise = 0 & no_book = 0 & Internet = 0	0.0000	00,009	0.0059	0.0850
Online H0: expertise = 0 & no_book = 0 & Internet = 0	0.0524	00,002	0.0000	0.0000
# obs	957	957	957	957

Note(s): The table reports the bivariate probit estimates for the four cultural domains analyzed. The dependent variables are online and onsite consumption. Robust standard errors. ***, **, * significance at 0.01, 0.05, 0.10

Source(s): Authors' own work

preferences or intrinsic motivation, jointly encourage participation in both modes across all cultural activities examined, with the exception of theatre.

Despite the highlighted commonalities, onsite and online consumers show some marked differences. Onsite consumption is linked to higher levels of formal education and to the absence of credit constraints. These associations do not emerge in the case of online consumption (museums excluded) and we interpret this as evidence of the fact that attending cultural events in person is relatively costly and therefore less accessible to those with limited financial resources. The negative correlation with health status further points to the physical difficulties that can prevent onsite attendance, but do not hamper online one.

Online consumption, in turn, appears to depend strongly on the quality of Internet infrastructure and on gender (theatre excluded), neither of which is significant for onsite consumption. The influence of Internet access is straightforward, since a reliable connection is a precondition for engaging with cultural content online. The gender effect is more puzzling and will be examined in the following section.

6. Further investigation

6.1 Gender effect

To try to shed more light on the role of gender in shaping cultural consumption. Table 5 presents the main findings of the biprobit model with variables interacted with gender, classified as female, *F*, or male, *M*. The inclusion of interaction terms highlights that the effects of some covariates differ between males and females. We use Wald tests to assess whether the observed differences are statistically significant at standard levels and restrict our comments to variables that pass the test at 95% statistical level in at least two of the domains. Consequently, Table 5 only reports a selection of the estimated coefficients, being the full set of results reported in the Online Appendix.

In the onsite consumption, most differences between male and female coefficients are statistically insignificant, while the differences between male and female in cultural

Table 5. Selected biprobit results with gender interactions

	Museums b/se	Theatre b/se	Classical music b/se	Other concerts b/se
<i>Onsite</i>				
no_book_F	-0.431 (0.350)	-0.742 (0.452)	-0.496 (0.435)	-5.810*** (0.461)
no_book_M	-0.625* (0.361)	-0.730 (0.444)	-5.667*** (0.300)	0.277 (0.423)
<i>Online</i>				
university_F	0.422 (0.433)	-0.336 (0.469)	-0.671 (0.494)	-4.897*** (0.231)
university_M	0.017 (0.366)	0.487* (0.269)	0.580** (0.271)	0.534* (0.298)
no_book_F	-4.015*** (0.465)	-4.714*** (0.531)	-4.458*** (0.472)	-4.418*** (0.226)
no_book_M	0.404 (0.390)	0.202 (0.424)	-0.125 (0.428)	-4.730*** (0.313)
health_F	-6.037*** (0.422)	-5.045*** (0.370)	0.215 (0.401)	-0.251 (0.372)
health_M	0.066 (0.352)	0.250 (0.338)	0.032 (0.297)	-0.194 (0.347)
no_adsl_F	0.339 (0.499)	-0.502 (0.444)	-4.891*** (0.256)	-5.097*** (0.374)
no_adsl_M	0.459 (0.338)	-0.125 (0.335)	0.024 (0.329)	0.451 (0.348)
# obs	957	957	957	957

Note(s): Dependent variables are online and onsite consumption. Interaction with gender dummy. The table displays only those coefficients for which the gender differences are statistically significant. Robust standard errors. ***, **, * significance at 0.01, 0.05, 0.10

Source(s): Authors' own work

consumption become evident in the online consumption. In onsite participation, the only statistically significant gender difference concerns the *no_book* covariate. The absence of books is a stronger barrier for males in classical music, whereas the pattern reverses in other concerts, where it is stronger for females.

By contrast, online consumption reveals a broader set of significant divergences, enriching the discussion on whether digital modes can overcome barriers to cultural participation. Health status, which is not significant in the overall sample, displays marked gender differences in online participation in museums and theatre. Online modes appear to mitigate health-related barriers for men but not for women. Similarly, having no books at home and Internet access play a stronger role in shaping female participation than male participation. The former may reflect the fact that books at home constitute a more accurate proxy of cultural capital for women than for men, while the latter suggests that women are more sensitive to inadequate broadband access when deciding to engage in online classical music and other concerts.

Conversely, holding a university degree – not statistically significant in the aggregate analysis – is positively associated with men's online participation but negatively associated with women's. This pattern may reflect gender differences in fields of study and technological familiarity, as well as differences in the relationship between income and cultural consumption across genders.

6.2 Age effect

In turn, to take account of the effect of age on cultural consumption, we perform the biprobit analysis by introducing interaction terms between age, classified as under (*u75*) or over (*o75*)

75 years, and all covariates. Table 6 displays selected results of the biprobit with interactions, being the complete results available in the Online Appendix.

The inclusion of interaction terms highlights that the effects of some covariates differ between respondents below and above the age of 75. As in the previous subsection, we discuss only covariates whose difference between over-75 and under-75 coefficients is statistically significant at 95% statistical level in at least two of the domains (see Online Appendix).

Onsite participation reveals only one marked age-related difference: having no books at home exerts a stronger negative effect among those over 75 than among the younger elderly. By contrast, differences are more pronounced for online consumption. Cohabitation status plays a central role, as being single significantly discourages online participation among the over-75 group. Cultural capital also operates differently across age groups. While education and books at home do not drive digital participation among the younger elderly, their effect becomes negative and significant among those over 75. This pattern likely reflects entrenched habits of in-person cultural engagement that are difficult to modify and may coincide with

Table 6. Selected biprobit results with age interactions

	Museums b/se	Theatre b/se	Classical music b/se	Other concerts b/se
<i>Onsite</i>				
no_book_u75	-0.246 (0.330)	-0.404 (0.391)	-0.696 (0.479)	0.034 (0.391)
no_book_o75	-4.952*** (0.210)	-5.272*** (0.259)	-4.405*** (0.324)	-5.596*** (0.645)
<i>Online</i>				
single_u75	-0.764* (0.390)	0.057 (0.273)	0.650*** (0.233)	-0.105 (0.259)
single_o75	-6.577*** (0.826)	-0.451 (0.390)	-0.815** (0.410)	-0.059 (0.393)
university_u75	0.221 (0.283)	0.251 (0.240)	0.203 (0.246)	0.276 (0.261)
university_o75	-6.166*** (1.139)	-5.647*** (0.374)	-5.797*** (0.501)	-4.804*** (0.613)
no_book_u75	-0.246 (0.330)	-0.404 (0.391)	-0.696 (0.479)	0.034 (0.391)
no_book_o75	-4.952*** (0.210)	-5.272*** (0.259)	-4.405*** (0.324)	-5.596*** (0.645)
internet_u75	0.497 (0.323)	1.236*** (0.287)	4.524 (3.466)	1.856*** (0.233)
internet_o75	0.812 (0.656)	0.040 (0.413)	0.485 (0.296)	0.662*** (0.312)
health_u75	0.038 (0.328)	0.216 (0.299)	0.319 (0.299)	-0.022 (0.294)
health_o75	-6.010*** (0.914)	-5.501*** (0.436)	-0.489 (0.474)	-5.180*** (0.325)
no_adsl_u75	0.323 (0.283)	-0.244 (0.283)	-0.397 (0.318)	0.126 (0.308)
no_adsl_o75	-4.452*** (0.907)	-4.990*** (0.430)	-4.614*** (0.378)	-5.004*** (0.429)
# obs	957	957	957	957

Note(s): In the table dependent variables are online and onsite consumption, with the interaction term age classified as under or over 75 years. The table displays only those coefficients for which the age differences are statistically significant. Robust standard errors. ***, **, * statistical significance at 0.01, 0.05, 0.10

Source(s): Authors' own work

forms of exclusion. Conversely, familiarity with the Internet promotes online participation among those under 75 but not among the oldest cohort.

Health constitutes another important dimension. Although health status does not substantially limit online participation among the under 75, it significantly reduces engagement among those over 75, particularly in museums, theatre, and concerts. Physical vulnerability, combined with technological barriers, thus creates disadvantages that digital provision cannot fully offset. Finally, Internet access further differentiates the two groups. Inadequate connectivity, such as reliance on ADSL, represents a significant obstacle for the over-75 group, underscoring how connectivity constraints disproportionately affect the oldest individuals.

7. Final remarks

In this article, we analyzed data from an original nationwide survey of older adults, focusing on onsite versus online cultural consumption. The aim was to investigate whether digitalization opens new avenues for cultural engagement or risks increasing the technological divide, a question that remains only partially explored for this growing population segment. The empirical results should be interpreted as capturing a lower bound of digital inequality in cultural participation. A first finding is the relatively small share of respondents who engage in cultural activities both onsite and online. Although online participation may reduce mobility and distance constraints, it remains far from widespread among older adults. Digital provision has therefore not yet become a systematic alternative or extension of traditional cultural access for this demographic group.

The econometric analysis indicates that onsite and online participation are not substitutes but display elements of complementarity. Individuals with higher cultural capital and stronger digital familiarity are more likely to participate in both modes, suggesting that digital access tends to reinforce existing engagement rather than generate entirely new audiences. At the same time, some barriers limiting onsite participation, health and economic constraints, appear less binding for certain forms of online engagement, though this effect varies across age and gender groups.

The heterogeneity analysis confirms that a uniform interpretation would be misleading. The oldest cohort (75+) faces more pronounced constraints, especially in the digital domain, where poor health and limited connectivity significantly reduce participation. Gender differences also emerge, indicating differentiated patterns of use and constraint. Across all groups, however, cultural capital remains a central determinant, confirming that participation reflects accumulated life-course resources rather than short-term adjustments.

These findings have implications for cultural policy. Expanding digital infrastructure, while necessary, is unlikely to be sufficient on its own. Individual capabilities and confidence in using digital tools are equally decisive. Policies aimed at strengthening digital literacy among older adults are therefore essential. Cultural institutions should also view online provision not merely as an emergency substitute but as a complement to onsite experiences. Carefully designed hybrid formats may help retain audiences facing mobility or health limitations without weakening the social dimension of participation. Finally, affordability remains crucial. The persistent role of credit constraints suggests that financial barriers continue to limit access, pointing to the importance of reduced pricing schemes or integrated access models. More generally, digitalization does not automatically democratize cultural participation. Without complementary investments in skills, affordability and institutional adaptation, online provision risks primarily benefiting those already engaged. An effective strategy therefore requires an integrated approach combining digital inclusion, education and institutional innovation.

This study represents a first step toward understanding how digital and traditional modes of cultural participation interact in later life. Future research could explore longitudinal dynamics and more closely examine causal mechanisms. As demographic ageing accelerates and digital

platforms reshape cultural markets, ensuring that older adults remain included in cultural life will require sustained policy attention. Additionally, the dimensions of cultural participation used in this analysis, museum attendance and theatre going, reflect historically consolidated institutional formats that are well acknowledged in the literature and well suited to the European context in which the analysis is embedded. Extending the framework to more contemporary measures of cultural engagement, including digitally mediated and participatory forms that have expanded rapidly following the proliferation of digital platforms, represents a natural direction for future research. Such an extension would allow the analytical approach developed here to be applied to geographic contexts beyond the EU, where traditional cultural infrastructure may be less developed, but where digital participation is growing rapidly, potentially revealing participation patterns and inequality mechanisms that the current indicators are not designed to capture.

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Note

1. This threshold is commonly used in gerontology to distinguish the “young-old” from the “oldest-old,” a stage characterized by sharper health limitations, mobility constraints and dependence that are more likely to affect participation. It also coincides with the Eurostat threshold for defining the non-working-age population and marks a clear structural break in our data: as shown in [Figure 1 \(Online Appendix\)](#), cultural consumption declines sharply after age 75 across all domains considered.

Supplementary material

The supplementary material for this article can be found online.

References

- Almeida-Meza, P., Di Gessa, G., Lacey, R., McMunn, A. and Xue, B. (2025), “Care provision and social participation among older adults in Europe: longitudinal evidence from the survey of health, ageing and retirement in Europe and the English longitudinal study of ageing”, *European Journal of Ageing*, Vol. 22, pp. 1-14, doi: [10.1007/s10433-025-00856-y](https://doi.org/10.1007/s10433-025-00856-y).
- Almomani, M. and Al-Masaeid, M. (2025), “The impact of education on instrumental activities of daily living: evidence from Europe using SHARE data”, *Journal of Economic Studies*, Vol. 52 No. 9, pp. 289-303, doi: [10.1108/jes-07-2025-0518](https://doi.org/10.1108/jes-07-2025-0518).
- Ammermueller, A. and Pischke, J.S. (2009), “Peer effects in European primary schools: evidence from the progress in international reading literacy study”, *Journal of Labor Economics*, Vol. 27 No. 3, pp. 315-348, doi: [10.1086/603650](https://doi.org/10.1086/603650).
- Ateca-Amestoy, V. (2008), “Determining heterogeneous behavior for theater attendance”, *Journal of Cultural Economics*, Vol. 32 No. 2, pp. 127-151, doi: [10.1007/s10824-008-9065-z](https://doi.org/10.1007/s10824-008-9065-z).
- Ateca-Amestoy, V. and Castiglione, C. (2023), “Live and digital engagement with the visual arts”, *Journal of Cultural Economics*, Vol. 47 No. 4, pp. 643-692, doi: [10.1007/s10824-022-09466-3](https://doi.org/10.1007/s10824-022-09466-3).
- Bakhshi, H., Di Novo, S. and Fazio, G. (2023), “The ‘Great Lockdown’ and cultural consumption in the UK”, *Journal of Cultural Economics*, Vol. 47 No. 4, pp. 555-587, doi: [10.1007/s10824-022-09463-6](https://doi.org/10.1007/s10824-022-09463-6).
- Beaunoyer, E., Dupéré, S. and Guitton, M.J. (2020), “COVID-19 and digital inequalities: reciprocal impacts and mitigation strategies”, *Computers in Human Behavior*, Vol. 111, pp. 1-9, doi: [10.1016/j.chb.2020.106424](https://doi.org/10.1016/j.chb.2020.106424).

- Bedard, K. and Dhuey, E. (2006), "The persistence of early childhood maturity: international evidence of long-run age effects", *Quarterly Journal of Economics*, Vol. 121 No. 4, pp. 1437-1472, doi: [10.1093/qje/121.4.1437](https://doi.org/10.1093/qje/121.4.1437).
- Bergantino, A.S., Fusco, G., Intini, M. and Monturano, G. (2026), "Digital divide and income inequality: causal evidence from Italian provinces", *The Annals of Regional Science*, Vol. 75 No. 1, 11, doi: [10.1007/s00168-025-01440-z](https://doi.org/10.1007/s00168-025-01440-z).
- Biondo, A.E., Coda Moscarola, F. and Zanola, R. (2024), "Promoting cultural consumption among the elderly", *Italian Journal of Economics*, Vol. 11 No. 1, pp. 313-340, doi: [10.1007/s40797-024-00270-w](https://doi.org/10.1007/s40797-024-00270-w).
- Bourdieu, P. (1986), "The forms of capital", *Handbook of Theory and Research for the Sociology of Education*, Greenwood, Westport, CT, pp. 241-258.
- Carella, M. and Misuraca, R. (2025), "Gender differences and physical limitations in the association between subjective well-being and cultural consumption among older people", *Journal of Happiness Studies*, Vol. 26 No. 3, pp. 1-27, doi: [10.1007/s10902-025-00875-7](https://doi.org/10.1007/s10902-025-00875-7).
- Cellini, R. and Cuccia, T. (2025), "In-person and On-line cultural participation amidst the digital change and the great lockdown: reflections on regional data from Italy", in Guccio, C., Mazza, I. and Pignataro, G. (Eds), *New Perspectives in the Public and Cultural Sectors*, Springer Nature, Cham.
- Censis (2023), "La nuova fase della digital life in Italia (The New Phase of Digital Life in Italy)".
- EU (2025), "Eurobarometer survey (2025), the digital decade 2025".
- Evans, M.D.R., Kelley, J., Sikora, J. and Treiman, D.J. (2010), *Research in Social Stratification and Mobility*, Vol. 28 No. 2, pp. 171-197, doi: [10.1016/j.rssm.2010.01.002](https://doi.org/10.1016/j.rssm.2010.01.002).
- Finn, S., Bone, J.K., Fancourt, D., Warran, K. and Wan Mak, H. (2025), "Longitudinal associations between cultural engagement and mental and social well-being: a fixed-effects analysis of the English longitudinal study of ageing", *The Journal of Gerontology: Series B*, Vol. 80 No. 7, pp. 1-9, doi: [10.1093/geronb/gbaf074](https://doi.org/10.1093/geronb/gbaf074).
- Fiorillo, D. and Ofria, F. (2025), "Cultural heritage participation in Italy: the role of human and social capital", *Journal of Economic Studies*, Vol. 52 No. 9, pp. 1-17, doi: [10.1108/jes-09-2024-0607](https://doi.org/10.1108/jes-09-2024-0607).
- Fluharty, M., Paul, E., Bone, J., Bu, F., Sonke, J. and Fancourt, D. (2021), "Difference in predictors and barriers to arts and cultural engagement with age in the United States: a cross-sectional analysis using the health and retirement study", *PLoS One*, Vol. 16 No. 2, pp. 1-16, doi: [10.1371/journal.pone.0261532](https://doi.org/10.1371/journal.pone.0261532).
- Ghenta, M., Matei, A., Mladen-Macovei, L. and Bobârnatv, E.S. (2022), "Factors associated with the participation of older adults in cultural and sports activities", *International Journal of Environmental Research and Public Health*, Vol. 19 No. 10, pp. 1-22, doi: [10.3390/ijerph19106244](https://doi.org/10.3390/ijerph19106244).
- Goulding, A. (2018), "The role of cultural engagement in older people's lives", *Cultural Sociology*, Vol. 12 No. 4, pp. 518-539, doi: [10.1177/1749975518754461](https://doi.org/10.1177/1749975518754461).
- Gutierrez-Navratil, F., Perez-Villadoniga, M.J. and Prieto-Rodriguez, J. (2024), "Attracting new audiences to high culture: an analysis of live broadcasted performing arts at cinema theaters", *Journal of Cultural Economics*, Vol. 48 No. 3, pp. 387-404, doi: [10.1007/s10824-023-09500-y](https://doi.org/10.1007/s10824-023-09500-y).
- Hargittai, E., Piper, A.M. and Morris, M.R. (2019), "From internet access to internet skills", *Information, Communication and Society*, Vol. 22 No. 4, pp. 1-17.
- Istat (2025), "Previsioni della popolazione residente e delle famiglie", Base 1/1/2024. Report.
- Keaney, E. and Oskala, A. (2007), "The golden age of the arts? Taking part survey findings on older people and the arts", *Cultural Trends*, Vol. 16 No. 4, pp. 323-355, doi: [10.1080/09548960701692696](https://doi.org/10.1080/09548960701692696).
- Lipp, B. and Peine, A. (2022), "Ageing as a driver of progressive politics? What the European silver economy teaches us about the co-constitution of ageing and innovation", *Ageing and Society*, Vol. 44 No. 7, pp. 1-13.

- Radermecker, A. (2021), "Art and culture in the COVID-19 era: for a consumer-oriented approach", *SN Business and Economics*, Vol. 1 No. 1, pp. 1-14, doi: [10.1007/s43546-020-00003-y](https://doi.org/10.1007/s43546-020-00003-y).
- Ragnedda, M. and Ruiu, M.L. (2020), "Digital capital: a Bourdieusian perspective on the digital divide", *Sociology*, Vol. 54 No. 3, pp. 470-488.
- Reeves, A. (2015), "Neither class nor status: arts participation and the social strata", *Sociology*, Vol. 49 No. 4, pp. 624-642, doi: [10.1177/0038038514547897](https://doi.org/10.1177/0038038514547897).
- Robinson, L., Cotten, S.R., Ono, H., Quan-Haase, A., Mesch, G., Chen, W., Schulz, J., Hale, T.M. and Stern, M.J. (2020), "Digital inequalities and why they matter", *Information, Communication and Society*, Vol. 23 No. 6, pp. 695-713.
- Super, N. (2020), "Three trends shaping the politics of aging in America", *Public Policy and Aging Report*, Vol. 30 No. 2, pp. 39-45, doi: [10.1093/ppar/praa006](https://doi.org/10.1093/ppar/praa006).
- UK Office for National Statistics (2019), "Exploring the UK's digital divide", available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteristics/homeinternetandsocialmediausage/articles/exploringtheuksdigitaldivide/2019-03-04>
- UNESCO (2012), *Measuring Cultural Participation*, Unesco Institute for Statistics.
- United Nations (2023), *World Social Report 2023: Leaving No One Behind in an Ageing World*, UNESCO, Montreal.
- van Deursen, A. and van Dijk, J. (2019), "The first-level digital divide shifts from inequalities in physical access to inequalities in material access", *New Media and Society*, Vol. 21 No. 2, pp. 354-375, doi: [10.1177/1461444818797082](https://doi.org/10.1177/1461444818797082).
- Vlandas, T., McArthur, D. and Ganslmeier, M. (2021), "Ageing and the economy: a literature review of political and policy mechanisms", *Political Research Exchange*, Vol. 3 No. 1, pp. 1-23, doi: [10.1080/2474736x.2021.1932532](https://doi.org/10.1080/2474736x.2021.1932532).
- Wang, Y. (2025), "Effect of population aging and economic growth: evidence from the largest 15 countries", *Journal of Economic Studies*, Vol. 53 No. 4, pp. 824-838.
- Wilson-Menzfeld, G., Erfani, G., Young-Murphy, L., Charlton, W., De Luca, H., Brittain, K. and Steven, A. (2025), "Identifying and understanding digital exclusion: a mixed-methods study", *Behaviour and Information Tehcnology*, Vol. 44 No. 8, pp. 1649-1666, doi: [10.1080/0144929x.2024.2368087](https://doi.org/10.1080/0144929x.2024.2368087).
- Yates, S., Kirby, J. and Lockley, E. (2015), "Digital media use: differences and inequalities in relation to class and age", *Sociological Research Online*, Vol. 20 No. 4, pp. 1-17, doi: [10.5153/sro.3751](https://doi.org/10.5153/sro.3751).

Further reading

- Istat (2014), "Resident population by sex, age, and marital status as of January 1, 2014", available at: www.demo.istat.it
- Istat (2020), "Population by educational qualification and age (2020)", available at: <https://esploradati.istat.it/databrowser/>
- Istat (2024), "Statistical classifications and dimensions of municipalities 30/06/2024", available at: www.istat.it/classificazione/principali-statistiche-geografiche-sui-comuni/

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