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Family Contact and Suicide in European Prisons: A Cross-National Observational Analysis

Contatti familiari e suicidio nelle carceri europee: un'analisi osservazionale trans-nazionale

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Abstract

Suicide represents a leading cause of death in prison systems across Europe. In Italy it represents a major cause of death in recent years, with more than 350 suicides recorded over the 2020–2024 five-year period. Against this background, this study examines the association between prison living conditions and suicide rates, with a specific focus on the role of family support. Using a comparative observational analysis of European administrative data (2020–2023), we investigate the association between the availability of external contact channels and suicide rates within the incarcerated population. At the macro level, the analyses consistently pointed towards lower suicide rates in countries with greater availability of family contact. In the primary model, a 0.20-point increase in the contact index was associated with an estimated 10% lower expected suicide rate, although the estimate was not statistically significant. The secondary population-weighted analysis showed a larger association, whose statistical significance depended on how uncertainty was assessed. The analysis highlights how social isolation and the lack of affective support may exacerbate psychological distress, contributing to a more negative outlook on the future. Across the study period, suicide rates tended to be lower in 2021–2023 compared

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with 2020, a pattern compatible with contextual factors specific to the period, including the COVID-19 pandemic. Overall, the findings support further investigation of family-contact availability as a potentially relevant component of suicide prevention in prison settings, alongside attention to the actual use and quality of these contacts.

Riassunto

Il suicidio rappresenta una delle principali cause di morte nei sistemi penitenziari europei. In Italia rappresenta una rilevante causa di morte negli ultimi anni, con oltre 350 suicidi registrati nel quinquennio 2020–2024. Il presente studio esamina l'associazione tra le condizioni di vita detentive e i tassi di suicidio, con particolare attenzione al ruolo della disponibilità di contatti familiari. Attraverso un'analisi osservazionale comparativa dei dati amministrativi europei relativi al periodo 2020–2023, viene indagata l'associazione tra la disponibilità di canali di contatto con l'esterno e i tassi di suicidio nella popolazione detenuta. A livello macro, le analisi hanno mostrato una direzione coerente verso tassi di suicidio più bassi nei Paesi con maggiore disponibilità di contatti familiari. Nel modello principale, un aumento di 0,20 punti dell'indice di contatto era associato a una riduzione stimata di circa il 10% del tasso atteso di suicidio, senza però raggiungere la significatività statistica. L'analisi secondaria, nella quale i sistemi penitenziari più grandi contribuivano maggiormente alla stima, ha mostrato un'associazione più marcata, la cui significatività dipendeva dalla modalità di valutazione dell'incertezza. L'analisi evidenzia come l'isolamento sociale e la mancanza di supporto affettivo possano aggravare il disagio psicologico. Nel periodo considerato, i tassi di suicidio sono risultati tendenzialmente inferiori tra il 2021 e il 2023 rispetto al 2020, un andamento compatibile con fattori contestuali specifici del periodo, tra cui la pandemia di COVID-19.

I risultati sostengono ulteriori approfondimenti sulla disponibilità dei contatti familiari quale componente potenzialmente rilevante delle strategie di prevenzione del suicidio in ambito penitenziario, prestando attenzione anche all'effettivo utilizzo e alla qualità di tali contatti.

Keywords: Family tie, suicide risk, social isolation, prison context, availability for family contact.

Parole chiave: legame familiare, rischio suicidario, isolamento sociale, contesto penitenziario, disponibilità al contatto familiare

Introduction

Suicide represents a critical public health issue within prison systems worldwide and consistently accounts for a substantial proportion of custodial deaths. Across European countries, suicide rates in detention remain

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significantly higher than in the general population (Fazel et al., 2011; Fazel et al., 2017). In Italy, suicide remains a major cause of death in custody, with more than 350 suicides recorded during 2020 – 2024 (Garante nazionale dei diritti delle persone private della libertà personale, 2024). Living conditions in Italian prisons have long been the subject of public debate and concern, particularly about the psychological well-being of incarcerated individuals. One critical aspect that has often been overlooked, concerns the impact of inadequate or dysfunctional family contexts on mood regulation, loss of future-oriented planning, diminished motivation for life, and, consequently, the emergence of suicidal ideation and self-destructive behaviors among detainees.

The World Health Organization highlights the loss of family and social support among the stresses of incarceration and identifies family visits as a means of fostering social support within prison suicide-prevention programmes (World Health Organization & International Association for Suicide Prevention, 2007).A growing body of evidence indicates that self-harm behaviors and suicide attempts are more frequent in incarcerated populations than in the general population (Bani et al., 2019; Castelpietra et al., 2018), and that key risk factors for suicidal behavior in prison include family abandonment and the receipt of adverse news, such as the illness or death of a family member or marital infidelity (Ministero della Giustizia, 2011).

The lack of family relationships also constitutes a major obstacle to rehabilitation and social reintegration processes, placing incarcerated individuals in an existential condition characterized by the perceived absence of a future beyond prison walls (Oretti & Castelpietra, 2012). Loneliness, lack of affective support, relational difficulties, physical distance from family members, and the absence of a stable emotional and psychological support network may exacerbate pre-existing psychological distress or contribute to the onset of new forms of suffering.

From this perspective, prison can be understood as a psychosocial system in which individual vulnerabilities, relationships and institutional conditions interact. Structural family therapy emphasizes the relevance of family relationships and organization to psychological functioning (Minuchin, 1977). Within detention settings, maintaining meaningful connections with significant others may represent a resource for coping with institutional stressors. This perspective places family contact within a broader understanding of suicide risk, alongside clinical and material conditions of detention. Perceived social support concerns the belief that help and emotional support are available when needed, rather than simply the existence of opportunities for communication (Cohen & Wills, 1985). A hypothesised pathway is that accessible contact enables meaningful interaction, which may strengthen perceived support and belonging, help regulate stress and sustain a sense of continuity and future possibility. The present study examines institutional contact availability. Actual contact and these psychological processes were not directly measured.

Research in adolescent populations has linked perceived parental support with more hopeful and optimistic views of the future (Neblett & Cortina, 2006), while future orientation has been associated with fewer problem behaviours in

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ways that vary with the school context (Chen & Vazsonyi, 2013). These findings provide a developmental rationale for considering whether meaningful family connections may help sustain future perspectives during detention.

The COVID-19 pandemic brought renewed attention to the psychological consequences of restrictions on family contact in prison. While the prison system inherently imposes restrictions on personal freedom, emergency measures adopted during the global health crisis further intensified the isolation of incarcerated individuals, particularly through the suspension or severe limitation of in-person family contact. The disruption of these relationships—crucial to prisoners' psychological stability—raised significant concerns regarding a potential increase in suicides and suicide attempts within the incarcerated population during the pandemic period. From a sociological perspective, the association between social isolation and suicidal behavior is well established. For incarcerated individuals, contact with family networks represents not only a connection to the outside world but also a source of meaning, identity, and emotional support; when these ties are disrupted, the risk of psychological deterioration increases. In prison settings, where the management of psychological distress is already particularly challenging, the suspension of family visits constituted a destabilizing factor for many individuals. Several studies have sought to quantify and better understand this phenomenon. Inmates admitted during the pandemic who reported fewer social relationships exhibited higher levels of suicidal intent, alongside greater psychological vulnerability, substance use, and distress (Santoriello et al., 2024). Prisoners' narratives described distress related to reduced family contact, uncertainty about the pandemic and feelings of abandonment (Sorge et al., 2021). A further highly relevant Italian contribution is provided by the study "Suicide Risk Screening and Assessment before and after the COVID-19 Pandemic in New Inmates", conducted on a sample of 2,098 newly admitted prisoners. This study identified significant differences between individuals entering prison before and after the onset of the COVID-19 pandemic. In particular, inmates admitted during the pandemic who reported having "fewer social relationships" exhibited higher levels of suicidal intent. A lower number of social relationships was also associated with a greater number of psychological vulnerabilities, substance use, and higher levels of psychological distress. These findings suggest that limited social relationships may be relevant to understanding suicidal intent among newly admitted prisoners. At the international level, a recent meta-analysis encompassing 77 studies across 27 countries identified the absence of social visits among the institutional factors associated with suicide in prison, alongside other variables such as psychiatric diagnoses, prior suicide attempts, isolation, and specific legal conditions (Zhong et al., 2021). This evidence indicates that, even prior to—and independently of—the COVID-19 pandemic, the scientific literature had already recognized the lack of external contacts as a measurable risk factor for suicide in prison settings. Together, these studies highlight the clinical relevance of social connections, although psychological distress, suicidal intent and suicide deaths represent distinct outcomes and should not be treated as interchangeable. The multifactorial nature of suicide requires caution: beyond the loss of family contact,

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other relevant contributors include length of detention, legal status (pre-trial detention vs. sentenced imprisonment), personal and clinical history, and the material conditions of incarceration. This evidence provides a rationale for examining family-contact opportunities within prison suicide prevention. The present study complements research on individual risk factors and experiences during the pandemic by comparing institutional contact conditions across European prison systems. Its specific contribution is to combine information on telephone, web/video and in-person contact in an aggregate index and examine its association with national suicide rates. The index describes institutional provision, rather than perceived support or the quality of family relationships.

Against this background, the present study aims to examine whether cross-national differences in the availability of family-contact channels are associated with differences in suicide rates across European prison systems. We hypothesize that countries with greater availability of contact channels will exhibit lower suicide rates at the macro level.

Materials and Methods

We conducted a comparative observational study of European prison systems over 2020–2023, combining Council of Europe SPACE I administrative data (Aebi & Cocco, 2024, 2025; Aebi et al., 2022; Aebi et al., 2023) with indicators from the WHO Health in Prisons European Database (HIPEDS; World Health Organization Regional Office for Europe, 2023). SPACE I provided suicide counts, prison population figures and institutional characteristics. Country names were harmonized before linking the sources by country and, for annual observations, year. HIPEDS contact and psychiatrist indicators referred to 2020 and were held constant within countries throughout the study period. Actual contact conditions may have changed during the pandemic; the 2020 indicators do not capture these changes. These measures therefore describe structural differences between countries rather than changes in contact provision over time. Year was included as a categorical variable to account for common differences across the observation period. Italy was excluded a priori because of data-use constraints. Country-year observations with fewer than 1,000 incarcerated persons were excluded to limit instability in rates from small populations. Inclusion also required the necessary HIPEDS indicators and complete information on the outcome and model covariates. The final sample comprised 90 country-year observations from 25 countries. Ten observations were excluded from these countries' potential four-year panel: three fell below the population threshold, four lacked suicide counts and three lacked prison occupancy data. The outcome was the annual number of suicides, also expressed as a rate per 10,000 incarcerated persons. The family-contact availability index combined three HIPEDS items covering telephone calls, web/video communication and in-person visits. Telephone and web/video responses were scored as 0 for "No", 1 for "Yes with time restrictions", 2 for "Yes, free of charge with time restrictions", and 3 for "Yes, free of charge". Visits were scored as 0 for unavailable and 1 for available. Missing responses were assigned zero; within the final sample, this

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concerned Albania's web/video item. The three scores were averaged, with higher values indicating more favourable contact conditions. This arithmetic summary combines availability with reported time and cost restrictions; telephone and web/video components have a wider scoring range than visits. The resulting index was rescaled to 0–1 using its observed minimum and maximum, 2/3 and 7/3. Zero therefore represents the least favourable configuration in the sample, rather than the absence of all contact channels. Effects are reported per 0.20-point increase, corresponding to a one-point increase in the summed component scores. The index captures institutional availability and reported time and cost restrictions, not actual use or relationship quality. Visits were available in all included countries, so between-country variation arose from telephone and web/video provision. Covariates were prison occupancy relative to official capacity, total staff per 100 incarcerated persons, psychiatrists per 1,000 incarcerated persons, and the proportion of prisoners not serving a final sentence (remand). Indicators of isolation were excluded because of extensive missing information.

The primary analysis used a negative binomial mixed-effects model of suicide counts, accounting for prison population size, differences between countries and year of observation. Associations were reported as incidence rate ratios (IRRs), with 95% confidence intervals. A secondary linear regression examined suicide rates, giving greater weight to larger prison populations. Uncertainty was assessed using robust standard errors, with an additional adjustment for repeated observations within countries. Sensitivity analyses examined whether the findings changed with alternative model specifications, restriction to 2021–2023, or omission of individual countries. The secondary analysis was also assessed without population weighting. Model convergence, residual patterns and collinearity were checked. All analyses were conducted in R.

Results

The analytical sample included 25 countries and 90 country-year observations, with 1415 recorded suicides. The median observed annual suicide rate was 8.79 per 10,000 incarcerated persons (interquartile range 4.31 – 12.80). The contact index ranged from 0 to 1, with 19 of the 25 countries scoring either 0 or 0.20 and one country scoring 1 (see Table 1 and Table 2). In the primary negative binomial mixed-effects model (NB-GLMM), a 0.20-point increase in the family-contact availability index was associated with an estimated 9.9% lower expected suicide rate (IRR of 0.90, 95% CI 0.75 – 1.09; p = 0.265). Figure 1 shows the adjusted relationship between contact availability and expected suicide rates, with 95% confidence intervals. In the secondary population-weighted linear model, the same increment corresponded to an estimated 2.69 fewer suicides per 10,000 incarcerated persons (HC1 95% CI −4.41 to −0.96; p = 0.003). The estimate remained inverse, but uncertainty increased when repeated observations within countries were accounted for. The direction of the contact estimate remained inverse in the minimal model, the Poisson model and the analysis restricted to 2021–2023; confidence intervals included no association in each specification. Omitting each country in turn also preserved the inverse direction,

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with estimated reductions ranging from 5.0% to 19.1% per 0.20 index points. Prison occupancy, total staffing and the proportion of prisoners not serving a final sentence showed no clear associations with suicide rates. Psychiatrist provision showed a positive but statistically non-significant estimate (IRR 1.27 per additional psychiatrist per 1,000 incarcerated persons, 95% CI 0.997–1.616; p = 0.053). Compared with 2020, adjusted rates were lower in 2022 (IRR 0.75; p = 0.003) and 2023 (IRR 0.79; p = 0.018); the difference for 2021 was not statistically significant. Figure 2 shows the distribution of observed country–year rates. The primary model converged, and residual checks did not identify significant departures in uniformity, dispersion, outliers or zero inflation. Collinearity estimates were low.

Discussion

At the country level, estimates consistently pointed towards lower suicide rates with greater availability of family-contact channels, although the primary estimate remained uncertain and compatible with no association. One possible interpretation is that meaningful family contact may sustain perceived support, belonging and a sense of continuity, helping individuals cope with institutional stress and maintain a future perspective. These psychological processes were not directly measured in the present study. The inverse direction was consistent across alternative models and when individual countries were omitted, suggesting that it was not attributable to a single modelling choice or country. The population-weighted analysis showed a significant and larger association, with greater influence from larger prison systems. Together, these findings support further investigation of contact availability as a potentially relevant component of suicide prevention. These results should nonetheless be interpreted within the boundaries of an observational analysis based on country-level administrative data. The reported associations are ecological (between-country) in nature and do not support individual-level inference or causal conclusions. The WHO/HIPEDS measures of contact availability and psychiatrist provision describe conditions reported in 2020 and were held constant throughout the study period. Restricting the analysis to suicide outcomes in 2021–2023 preserved the inverse direction of the contact association, although the estimate was smaller and remained uncertain. Unmeasured confounding and cross-national differences in reporting remain possible. Institutional availability does not necessarily imply practical access, frequent contact or supportive relationships. Future studies should therefore examine how contact opportunities are used and whether they are experienced as meaningful support. Adjusted suicide rates were lower in 2022 and 2023 than in 2020, whereas the difference for 2021 was less clear. These annual differences cannot be attributed specifically to the suspension or resumption of family visits. Nevertheless, research during the pandemic provides relevant clinical context. In Northern Ireland, prisoners described distress during isolation and identified family contact as a priority, with telephone calls and virtual visits perceived as helpful (Gray et al., 2021). In Catalonia, accounts of isolation highlighted anxiety, stress and disrupted communication, alongside

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coping through social support (Clua-García et al., 2024). In France, healthcare providers reported anxiety, psychiatric deterioration and challenges to continuity of care during confinement (Fovet et al., 2020). These studies underline the relevance of maintaining communication and support during restrictive regimes, rather than establishing an explanation for the annual suicide-rate differences observed here. In line with the theory of perceived social support, the awareness of being able to rely on significant others—even at a distance—plays a crucial role in buffering stress and sustaining resilience (Cohen & Wills, 1985). In detention settings already characterized by structural stressors—such as overcrowding, legal uncertainty, and limited access to specialized care—the suspension of family contact may therefore act as a multiplier of pre-existing vulnerability. In other words, part of the observed variation plausibly reflects the broader historical–institutional context, not only differences in the organizational features of national prison systems. Psychiatrist provision showed a positive but uncertain association with suicide rates, whereas total staffing showed no clear association. The former may reflect differences in service organisation or allocation in response to greater clinical need, rather than an adverse effect of psychiatric care. The proportion of prisoners not serving a final sentence showed no clear association with suicide rates. This indicator describes the prison population at a particular point in time, whereas suicide counts cover the whole year. More detailed longitudinal data would help clarify the relationship between legal status and suicide risk.

Conclusions

The consistent inverse direction of the estimates supports continued attention to family-contact opportunities within comprehensive prison suicide-prevention strategies. Future studies should examine whether accessible and meaningful contact strengthens perceived support and contributes to lower suicide risk, alongside clinical care and other institutional measures. Structural limitations remain. Several variables are effectively time-invariant over the study period; definitional heterogeneity across countries may affect comparability; and, most notably, harmonized data on isolation are lacking. These constraints point to clear priorities for future research including the standardization of key indicators (e.g., isolation, self-harm, suicide attempts), the development of more granular longitudinal data, and, where feasible, the rigorous evaluation of interventions through quasi-experimental designs.

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Appendix

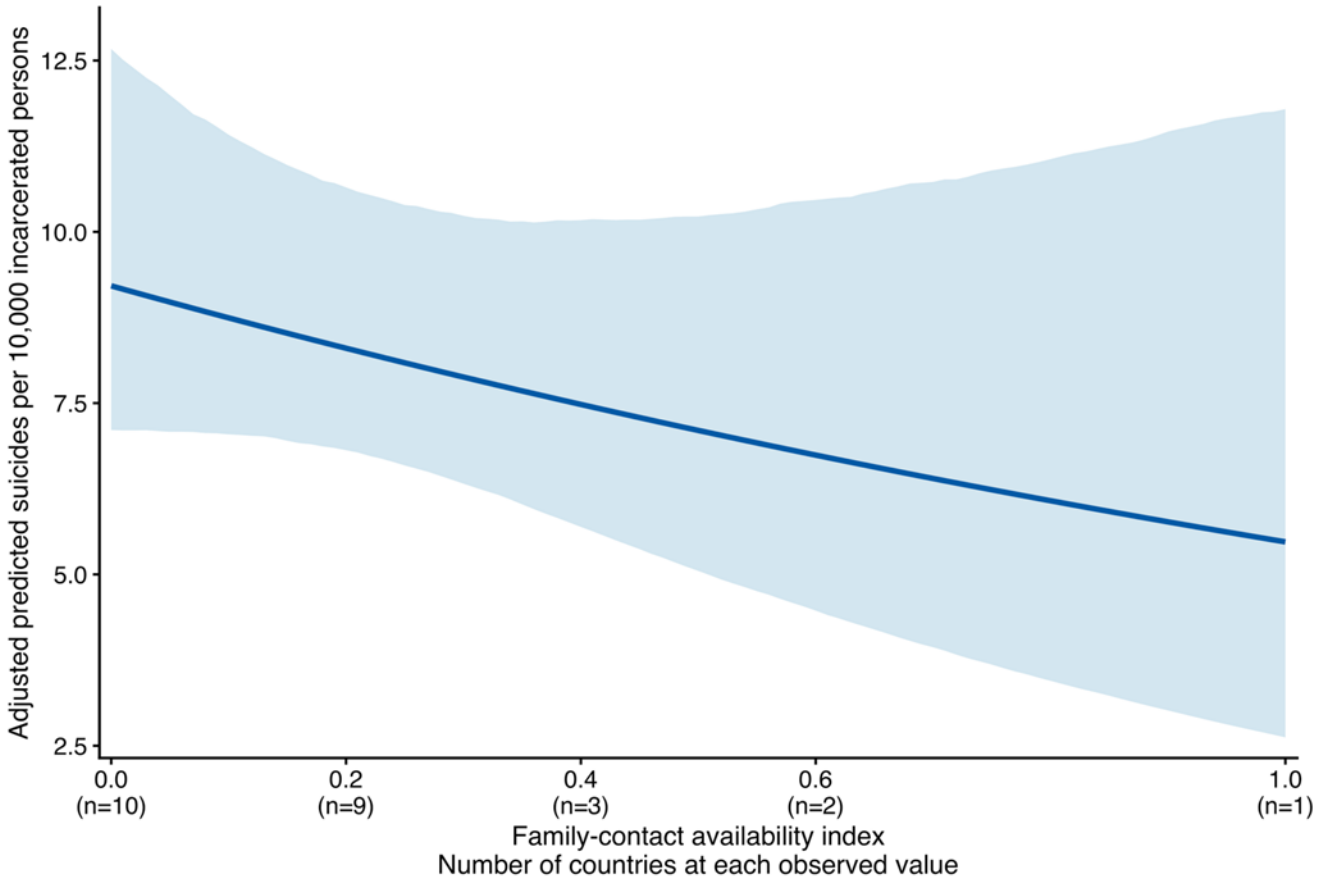


Figure 1: Adjusted ecological association between family-contact availability and suicide rates. The solid line represents adjusted predictions from the primary negative binomial mixed-effects model, expressed per 10,000 incarcerated persons; the shaded area represents 95% confidence intervals. Numbers below the observed index values indicate the number of countries. The association is estimated between countries and does not establish an individual-level or causal effect.

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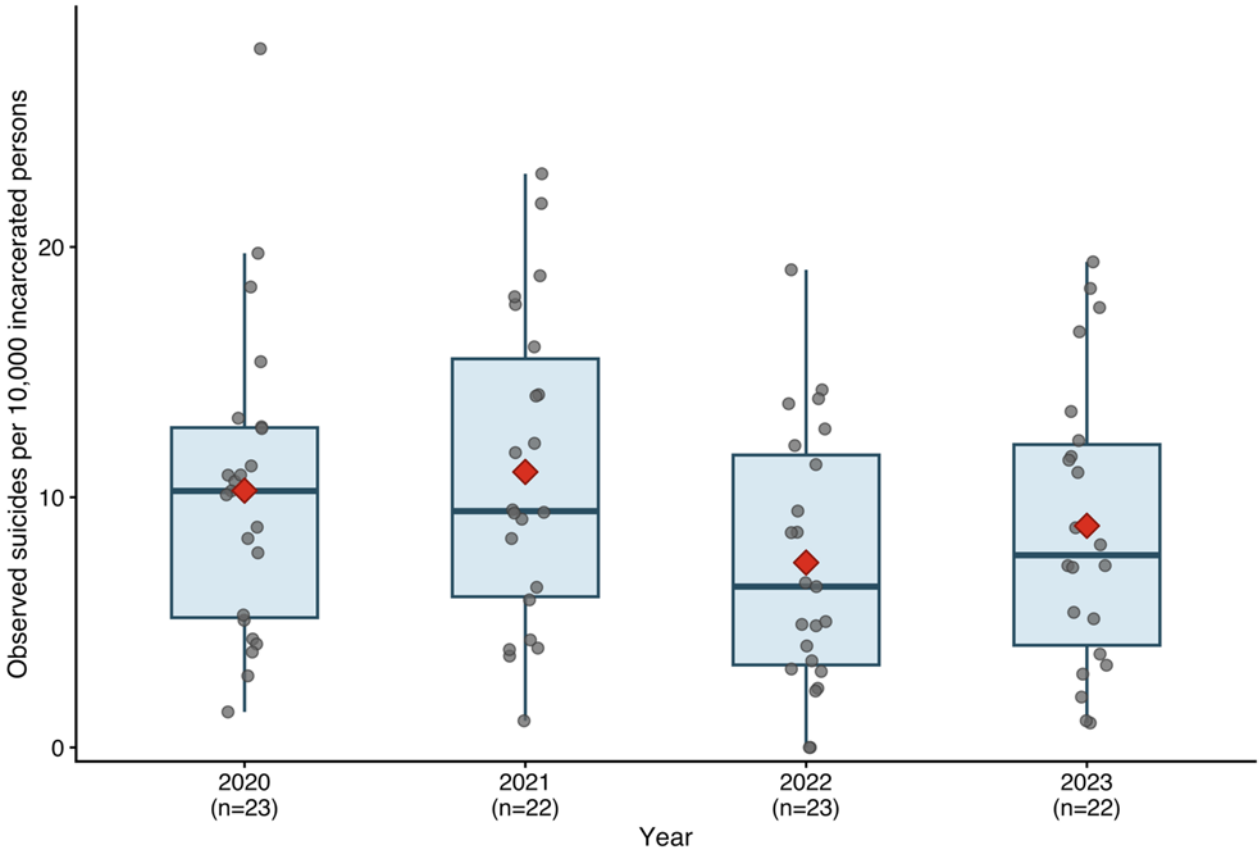


Figure 2: Distribution of observed annual suicide rates per 10,000 incarcerated persons, 2020–2023. Points represent country-year observations; boxes show the interquartile range, with the median indicated by the horizontal line. Diamonds indicate annual means. The number of available observations is reported below each year.

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Table 1
Countries and available observations from 2020 to 2023

Country	Years (n)	Median prison population	Total suicides	Mean annual suicide rate	Contact index
Albania	4	4,984	11	5.66	0.0
Armenia	4	2,242.5	9	10.00	0.6
Austria	2	8,469.5	24	14.17	0.2
Belgium	4	11,078	56	12.61	0.2
Bulgaria	3	6,501	4	2.27	0.6
Cyprus	1	1,026	0	0.00	0.4
Czechia	4	19,169	69	8.97	0.2
Denmark	4	4,121.5	13	8.01	0.0
Estonia	4	2,118.5	11	12.90	0.0
Finland	4	2,844	12	10.85	1.0
France	4	71,129	573	20.61	0.0
Georgia	4	9,478.5	10	2.64	0.2
Greece	4	10,708.5	20	4.63	0.4
Hungary	4	18,674	22	2.92	0.2
Ireland	1	4,432	1	2.26	0.0
Latvia	3	3,183	18	18.98	0.2
Lithuania	4	5,029.5	24	12.18	0.0
Moldova	4	6,232	22	8.91	0.2
Netherlands	4	9,374.5	44	11.66	0.0
Portugal	4	11,890.5	60	12.67	0.0
Romania	4	23,025	32	3.50	0.2
Slovakia	4	10,062	26	6.44	0.0
Slovenia	4	1,407.5	9	15.27	0.4
Spain	4	55,509.5	197	8.85	0.0
Ukraine	4	46,031	148	7.91	0.2

Note. The sample comprises 25 countries and 90 country-year observations, with 1,415 suicides. Suicide rates are expressed per 10,000 incarcerated persons. Mean annual rates are unweighted means over each country's available years; suicide totals and median population stocks refer to

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those years. The contact index ranges from 0 to 1 within the sample, with higher values indicating greater availability.

Table 2
Descriptive characteristics of the study sample

Variable	N	Median [Q1–Q3]	Minimum–maximum
Annual suicide rate per 10,000 incarcerated persons	90	8.79 [4.31–12.80]	0.00–27.92
Family-contact availability index	25	0.20 [0.00–0.20]	0.00–1.00
Prison population	90	9,361.5 [4,154.2–18,335]	1,026–76,275
Prison occupancy (%)	90	91.55 [73.70–100.38]	36.80–165.50
Staff per 100 incarcerated persons	90	58.82 [50.00–76.92]	34.48–125.00
Psychiatrists per 1,000 incarcerated persons	25	1.22 [0.48–1.71]	0.00–3.20
Prisoners not serving a final sentence (%)	90	22.80 [16.84–35.57]	5.04–58.20

Note. Q1 and Q3 are the 25th and 75th percentiles. Contact availability and psychiatrist provision are described across 25 countries: both were measured in HIPEDS 2020 and held constant over time. Other variables are described across 90 country-year observations. Occupancy is the prison population as a percentage of official capacity.

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Table 3
Results of the primary and secondary analyses

A - Primary negative binomial mixed-effects model				
Predictor	**Increment or comparison**	**Adjusted IRR**	**95% CI**	**p**
Family-contact availability	+0.20 index points	0.901	0.748–1.088	0.265
Prison occupancy	+10 percentage points	0.995	0.913–1.084	0.914
Staff availability	+10 per 100 prisoners	1.031	0.938–1.132	0.527
Psychiatrists	+1 per 1,000 prisoners	1.269	0.997–1.616	0.053
Prisoners not serving a final sentence	+10 percentage points	0.985	0.817–1.188	0.877
Year 2021	vs 2020	0.841	0.680–1.042	0.113
Year 2022	vs 2020	0.753	0.623–0.910	0.003
Year 2023	vs 2020	0.793	0.654–0.961	0.018
B - Secondary population-weighted linear regression				
Predictor	**Increment**	**Difference in rate**	**95% CI (HC1)**	**p (HC1)**
Family-contact availability	+0.20 index points	−2.69	−4.41 to −0.96	0.003

Note. Both analyses include 90 observations from 25 countries. IRR = incidence rate ratio; CI = confidence interval. For contact, the CI is profile-likelihood and p is from a likelihood-ratio test; other primary-model CIs and p-values use Wald inference.

Note. The secondary rate difference is expressed per 10,000 incarcerated persons. Population weighting gives greater influence to larger prison systems. HC1 intervals and p-values use robust standard errors