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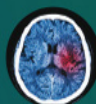
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A nationwide survey of Italian centers for cognitive disorders and dementia on the provision of care for international migrants

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Abstract

Background. More than 500,000 dementia cases can be estimated among migrants living in Europe. There is the need to collect "real world" data on the preparedness of healthcare services to support the inclusion of migrants in the public health response to dementia. The present study aimed i) to estimate the number of migrants referred to Italian memory clinics (CCDDs) and ii) to identify possible barriers and resources for the provision of diversity-sensitive care.

Methods. A survey of all Italian CCDDs was conducted between December 2020 and April 2021. An online questionnaire was developed to obtain information on the number of migrants referred to Italian CCDDs in 2019, the challenges encountered in the diagnostic approach, possible facilitators in the provision of care.

Results. Overall, 343 out of the 570 contacted CCDDs completed the survey questionnaire (response rate: 60.2%). Nearly 4,527 migrants were referred to these services in 2019. Migrants accounted for a median 1.1% (IQR: 0.9%-2.8%) of overall CCDD referrals. More than one-third of respondents reported that the number of migrants referred to their facilities had increased in the last five years. The overall quality of the migrants' cognitive assessment resulted as very poor or insufficient in most cases. A minority of CCDDs had translated information material on dementia and reported the possibility to contact cultural mediators and interpreters.

Conclusions. A relevant number of migrants is being referred to Italian CCDDs that are still not adequately prepared to deliver diversity-sensitive care and support.

Keywords: dementia; migration; diversity; culture-sensitivity.

Introduction

International migration represents one of the most distinctive phenomena of our times. According to the United Nations, the estimated number of international migrants (i.e., people living in a country other than their country of birth) steadily increased in the last 30 years worldwide, passing from 153 million in 1990 to 281 million in 2020[1]. Migrants currently account for 3.6% of the World's population[1].

In recent years, there has been a gradual change in the structure and physiognomy of migrant populations, especially in Western countries. Due to population aging[2], the proportion of older international migrants is rapidly rising. In Europe, the number of individuals aged more than 60 years with a history of migration has more than doubled in the last three decades, moving from nearly 9 million in 1990 to more than 19 million in 2020[1]. As a result, our societies are and will increasingly be composed of ethnically and culturally diverse older people.

These demographic transitions are inevitably accompanied by a gradual shift in the morbidity patterns as well as in the health needs of migrants. Indeed, migrants are growingly exposed to the burden of age-related chronic diseases and multimorbidity[3,4]. Developing diversity-sensitive policies and practices is therefore imperative for our healthcare systems to optimize the functional abilities and guarantee the wellbeing of all older people, in line with the principles of the United Nations Decade of Healthy Ageing (2021-2030)[5].

In this regard, it has recently been estimated that, in Europe, about 500,000 people with a migration background live with dementia[6,7]. Additionally, a high number of foreign-born individuals (around 680,000) are struggling with milder cognitive disorders[8]. The occurrence of cognitive disturbances in migrants poses additional challenges to the diagnostic approach and provision of care. Language difficulties, low education, and poor health literacy can postpone help-seeking and constitute significant barriers to diagnosis[9,10]. The cognitive assessment can be biased by the limited availability of culture-sensitive tests and normative data as well as by the difficulty of resorting to cultural mediators and interpreters[11,12]. Most healthcare professionals lack specific training and dedicated services are still poorly prepared and equipped to provide culturally competent care to this population[9,10,12]. Consequently, migrants with cognitive impairment often experience worse health outcomes compared to their native counterparts. Several studies conducted in Europe showed that migrants have a lower likelihood of receiving a dementia diagnosis and treatment and face inequalities in the access to appropriate care and support[13–16]. Based on these premises, the issue of dementia in migrants and culturally diverse people has already been incorporated in the National Dementia Plans and Strategies of several countries[17,18]. There is the need to collect "real world" information on the dimensions of this emerging challenge and the

preparedness of healthcare services to foster the inclusion of migrants (as other vulnerable groups) in the public health response to dementia [9,20].

The present study aimed to estimate the number of international migrants referred to memory clinics in Italy (referred to as Centers for Cognitive Disorders and Dementia [CCDDs]), to document existing discrepancies in the activity and preparedness of Italian dementia services, and to identify those attributes that may be associated with higher standards of care in these settings.

Methods

Surveyed services

The rationale and methodology of the present study have already been published elsewhere[21]. Briefly, a national survey of Italian CCDDs was conducted between December 2020 and April 2021.

CCDDs, whose activities are comparable to that of memory clinics in other Western countries, are outpatient services leaded by clinical specialists in neurology, geriatrics, or psychiatry that are dedicated to the diagnosis, treatment, and management of patients with dementia and other cognitive disorders[22,23]. People with suspicion or diagnosis of cognitive impairment or dementia living in the country are referred to these centers by their general practitioners or other specialists. In Italy, the prescription of anti-dementia drugs (i.e., cholinesterase inhibitors and memantine) and antipsychotics is entirely entrusted to CCDDs, as required by the Italian Medicines Agency (AIFA). CCDDs are mostly public services, and their activities are completely covered by the Italian National Health System.

CCDDs are currently listed and mapped on the Dementia Observatory, a dedicated web platform that provides practical information on their activity (e.g., address, contacts, opening hours, how to access the service) (https://www.iss.it/le-demenze). Before the start of the survey, the list of national CCDDs was updated through direct interactions with designed delegates for dementia from each Italian region and autonomous province. Updated contact details of each facility and their representatives were also provided by regional delegates or obtained from personal and professional contacts and web resources (e.g., websites of healthcare districts).

Definition of migrants

The present survey focused on international migrants (hereafter referred to as *migrants*) defined as any person who changes his or her country of usual residence, regardless of the reason for migration, length of stay, and legal status[24]. Nearly 6.4 million migrants currently live in Italy, accounting for 10.6% of the overall population[1]. The largest migrant communities in the country are those coming from Eastern and Southern Europe (i.e., Romania, Albania, Ukraine, and Moldova), Northern Africa (i.e., Morocco, and Egypt), and Eastern and Southern Asia (i.e., China, India, Philippines, and Bangladesh).

Questionnaire

An online questionnaire was developed to obtain information on the number of migrants referred to Italian CCDDs in 2019, the challenges encountered in the diagnostic approach, and possible barriers and facilitators in the provision of care. The choice to focus on 2019 was motivated by the fact that, during 2020, the activity of CCDDs was profoundly subverted by the COVID-19 pandemic[25].

The final survey consisted of 12 questions (five open-ended questions, five single-choice questions, and two multiple-choice questions), grouped into three sections. The adopted definition of migrants was reported at the beginning of the questionnaire to clarify the object of the survey. The first section of the questionnaire required the representatives of CCDDs to provide quantitative information on migrant patients referred to their service and underwent a neuropsychological assessment in 2019. Respondents were also asked to indicate if the proportion of migrants accessing their service was increased, decreased, or remained stable in the last years to obtain information on possible temporal changes in the dimensions of the phenomenon. The second section specifically concerned the adopted assessment tools for the cognitive evaluation of migrants as well as the preparedness of CCDDs to diagnose and manage dementia/cognitive disorders in migrants (e.g., knowledge of foreign languages, availability and use of translated or cross-cultural screening/assessment tools, availability of translated information material on dementia, involvement of professionals such as cultural mediators and interpreters). The last section focused on the main complexities and barriers faced in the provision of care for migrants with cognitive disturbances. An English version of the survey is presented as Supplementary Material.

Pilot studies

The questionnaire was validated in a pilot study involving a convenience sample of 24 CCDDs to ensure that respondents fully understood questions and instructions (Figure S1). These services were equally distributed between the Italian geographic macro-areas (i.e., North, Center, South) and care settings (i.e., community, hospital, university).

The results of the pilot survey were then discussed in two focus groups involving a convenience sample of 20 healthcare providers (i.e., neurologists, geriatricians, general practitioners, social-care workers, neuropsychologists) with professional experience in migrants' health. The focus groups were conducted by experienced facilitators using a semi-structured guide. This qualitative research approach was adopted to guarantee that the main contents surrounding the issue of dementia and migration were covered by the survey.

Survey procedures

A link to access the questionnaire was emailed to the representatives of all Italian CCDDs together with an introductory cover letter detailing the objectives of the study. Each CCDD was assigned a unique code to access and complete the questionnaire in a web-based data entry system. Only one response per service was allowed. Even those centers where no migrants had been visited in 2019 were asked to fill the subsequent sections of the questionnaire about resources and barriers. In fact, these centers could have

received migrants in previous years and therefore still provide valuable information on their past experiences.

To enhance participation and maximize the response rate, participants were contacted by initial and follow-up emails and received telephone support, if required. Data provided by respondents was collected in the online platform and then exported for statistical analysis.

Ethical approval

This study was performed in line with the principles of the Declaration of Helsinki. The study protocol was approved by the Ethics Committee of the Italian National Institute of Health (protocol 10749; 5 April 2018).

Role of the funding source

The "Dementia in immigrants and ethnic minorities living in Italy: clinical-epidemiological aspects and public health perspectives" (ImmiDem) project is supported by a research grant from the Italian Ministry of Health (GR-2016-02364975). The funding source had no involvement in the design, execution, interpretation, or writing of the study.

Statistical analysis

The response rate was calculated as the percentage of CCDDs responding to the survey out of the total eligible CCDDs. It was considered as a measure of the survey's quality and success[26].

The Kolmogorov-Smirnov test was used to verify the normal distribution of continuous variables that were reported as median and interquartile ranges (IQR) or as mean and standard deviations (SD), as appropriate. Categorical variables were reported as absolute values and percentages.

To assess the quality of the cognitive assessment of migrants, the tests and measures adopted by each CCDD were rated in terms of i) accuracy and ii) culture-sensitivity. For accuracy, the following scores were assigned: no cognitive assessment = 0 ("none"); use of only screening tools or tests of global cognitive performance (e.g., Mini Mental State Examination [MMSE], Montreal Cognitive Assessment [MoCA]) = 1 ("insufficient"); use of at least one neuropsychological test or a neuropsychological test battery = 2 ("sufficient"). For culture-sensitivity, the following possible cultural adaptations of the cognitive assessment were considered: i) preferential choice of non-verbal neuropsychological tests; ii) adoption of cross-cultural cognitive assessment tools validated in multicultural populations; iii) involvement of a professional or informal interpreter and/or cultural mediator; and iv) any other explicit adaptation to the cultural background of the migrant. The following rating system was adopted: no mention of any cultural adaptation of the cognitive assessment = 0 ("poor"); one cultural adaptation = 1 ("partial"); two or more

cultural adaptations = 2 ("sufficient"). An overall quality score was then generated by summing up the scores obtained for accuracy and culture-sensitivity, thus potentially ranged between 0 and 4, and categorized as follows: 0 = "very poor quality"; 1-2 = "insufficient quality"; 3-4: "sufficient quality".

CCDDs were grouped into three geographic macro-areas (i.e., North, Center, and South) according to the Italian National Institute of Statistics categorization of regions. The geographic distribution of participating vs. non-participating services was compared through the Chi-square test. The characteristics, activities, and resources of CCDDs in the three macro-areas were compared by means of Chi-square test for categorical variables, and Kruskal-Wallis test for continuous variables.

The characteristics of CCDDs were also compared according to i) the number of migrants referred to the service in 2019 (≥1 migrant vs. no migrants) and ii) the quality of the cognitive assessment (sufficient vs. very poor/insufficient) using the Chi-square test for categorical variables and the Mann-Whitney test for continuous variables. The variables emerging as statistically significant or suggestive (p<0.10) at these univariate analyses were then included in two logistic regression models exploring the variables associated with i) ≥1 one migrant referred to the service in 2019 and ii) sufficient quality of the cognitive assessment of migrants (dichotomized dependent variables of interest).

The level of statistical significance was set at p <0.05. All analyses were performed using SPSS version 25 for Mac.

Results

Response rate

Overall, 343 out of the 570 eligible CCDDs completed the survey questionnaire: 161 from Northern Italy, 96 from Central Italy, and 86 from Southern Italy (Figure 1A, Table 1, and Figure S2). The national response rate was 60.2%, ranging from 21.4% (Puglia) to 100% (Friuli Venezia Giulia, Marche, and Valle D'Aosta) across Italian regions (Figure 1B). Most CCDDs were community- (45.8%) or hospital-based (40.2%) whereas only 14% were affiliated with universities or research institutes.

Significant differences by geographic macro-area were observed between CCDDs responding (North: 46.9%; Center: 28.0%; South: 25.1%) and not responding (North: 43.6%; Center: 14.1%; South: 42.3%) to the survey (p<0.001).

Number of migrants referred to the surveyed CCDDs

Based on the data provided by the representatives of the surveyed CCDDs, a total of 4,527 migrants were referred to these services in 2019, with a median number of 5 (IQR: 1-15) migrant patients per CCDD (Table 1 and Figure 2). In the same year, 2,040 migrants underwent a neuropsychological assessment, with a median number of 2 (IQR: 0-7) assessments per service. At the national level, migrants accounted for a median 1.1% (IQR: 0.1%-2.8%) of overall CCDD referrals and a median 0.9% (IQR: 0.0%-3.0%) of overall neuropsychological assessments. Nearly three-quarters of CCDDs (75.5%) had visited at least one migrant in 2019. More than one-third of respondents (37.9%) reported that the number of migrants referred to their facilities had increased in the last five years.

The number of migrants referred to CCDDs and undergoing a neuropsychological assessment, the proportion of services that received at least one migrant in 2019, and the percentage of facilities that registered an increasing trend in the number of migrants over the last years were higher in the Northern and Central regions relative to the South of Italy (all p values <0.001) (Table 1 and Figure 2).

Cognitive assessment of migrants

Less than half of the CCDDs (41.4%) adopted screening tools or measures of global cognitive performance for the assessment of migrants (mostly MMSE and MoCA). A slightly lower proportion of services (39.9%) implemented comprehensive neuropsychological test batteries, thus providing a more accurate cognitive evaluation. Conversely, the representatives of 64 CCDDs (18.7%) stated that migrants did not undergo any cognitive assessment at their service (Table 1). Only in a minority of cases, the cognitive assessment was sufficiently (2.3%) or at least partly (14.9%) adapted to the cultural background of the tested person. The most common adaptations were the involvement of informal (e.g., caregivers) or professional interpreters,

the choice of non-verbal neuropsychological tests (e.g., Raven's Progressive Matrices), and the assistance of a cultural mediator. Four CCDDs (1.2%) adopted instruments that have already been validated in multicultural populations (i.e., the Cross-Cultural Dementia Screening [CCD][27] and the Rowland Universal Dementia Assessment Scale [RUDAS][28]). The resulting overall quality of the migrants' cognitive assessment was deemed insufficient in most cases (68.2%).

The proportion of CCDDs offering a sufficient-quality cognitive evaluation to migrants was higher in the North (17.4%) and Center (14.6%) relative to the South (3.5%) (Table 1). On the contrary, the proportion of facilities providing a very poor-quality assessment was higher in Southern regions (33.7%) (p<0.001).

Resources and complexities in the provision of care for migrants with cognitive disturbances

In most CCDDs, staff members were reported to speak at least one foreign language (Figure S3). Social-care workers were present or available in most services, whereas only a minority of CCDDs reported the possibility to contact cultural mediators (37.3%) and interpreters (10.5%) and had information material on dementia in languages other than Italian (6.7%). Overall, these resources were more frequently available in Northern CCDDs. A north-to-south gradient was observed concerning the involvement of cultural mediators and interpreters (Table 1).

Based on the experience of respondents, the main challenges encountered in the provision of care for migrants with cognitive disturbances were the communication of the diagnosis, the formulation of the diagnosis, and the involvement of family members (Figure 3). The management of pharmacological treatments and neuropsychiatric symptoms was instead considered challenging by a smaller number of centers.

Nearly one-quarter of respondents considered the issue of dementia in migrants as a priority for their service.

Predictors of selected process and structure indicators

Univariate analyses comparing the characteristics of CCDDs according to i) the number of migrants referred to the services (≥1 migrant vs. 0 migrants) and ii) the quality of the cognitive assessment of migrants (sufficient vs. insufficient or very poor) are reported in Tables S1 and S2.

In multi-adjusted models, the variables that resulted to be positively associated with ≥1 migrant referred to the CCDD were the increasing number of migrants in the last five years (OR: 21.00, 95%CI: 4.82-91.58; p<0.001) and the insufficient (OR: 9.07, 95%CI: 4.16-19.77; p<0.001) and sufficient (OR: 8.89, 95%CI: 2.48-31.92; p<0.001) quality of the cognitive assessment of migrants (Figure 5A). Conversely, the probability of visiting migrants was lower in Southern regions (OR: 0.23, 95%CI: 0.10-0.55; p<0.001). The only factor

associated with the quality of the cognitive assessment of migrants was the geographic macro-area, with CCDDs of the South having a lower probability of providing a sufficient-quality evaluation (OR: 0.23, 95%CI: 0.39-1.71; p=0.03) (Figure 5B).

Discussion

The present study aimed to estimate the number of migrants seeking evaluation for cognitive disturbances at Italian dementia services and to survey possible barriers and facilitators for the provision of culturally competent care for this population.

The survey results indicate that a relevant number of migrants are being referred to Italian CCDDs. The proportion of migrants accessing these services, albeit still marginal compared to that of native patients, has relevantly increased in recent years, especially in the Northern and Central regions. Some healthcare professionals already perceive this phenomenon as a care priority for their facilities. However, the survey provides an underestimation of the number of migrants living with dementia in the country. Indeed, a sizeable proportion of CCDDs did not participate in the study. Moreover, only regular migrants who have access to the National Health System are referred to these services. Thus, refugees, asylum seekers, and undocumented migrants potentially experiencing a cognitive impairment were not captured by the survey. In this regard, nearly 58,000 MCI and dementia cases can be estimated in the migrant population living in Italy by applying age-specific prevalence rates[6,8]. This number is about 13 times greater than that of migrants accessing dementia services captured by this survey.

Overall, Italian dementia services do not seem adequately prepared to deliver diversity-sensitive care and support. Specifically, there is the need to develop, validate, and implement screening tools and neuropsychological tests that may support a cross-cultural cognitive assessment. These instruments should have the following properties: i) measuring the same cognitive function in people from different cultures (i.e., construct validity); ii) being little influenced by education and cultural factors; and iii) clearly distinguishing between people with and without cognitive impairment independent from their cultural background. These requirements do not apply to most cognitive tests that are routinely used in Italian CCDDs and European memory clinics (e.g., Mini-Mental State Examination, Trail Making Test, Boston Naming Test, Rey Auditory Verbal Learning Test)[11,12]. Encouragingly, several cross-cultural cognitive assessment tools have recently been developed and standardized across Europe, such as the aforementioned CCD[27] and RUDAS[28], the European Cross-Cultural Neuropsychological Test Battery[29], and the Multicultural Cognitive Examination[30]. Nevertheless, it is crucial to enhance their use in daily practice and to improve the training of neuropsychologists in cross-cultural cognitive assessments, as advocated by the newborn European Consortium for Cross-Cultural Neuropsychology (ECCroN)[31]. Along the same lines, the collaboration of CCDDs with professional interpreters should be reinforced and possibly supported by the development of recommendations/guidelines for interpreter-mediated neuropsychological assessment in diverse populations. In this regard, the proportion of Italian CCDDs using interpreters (10.5%) was found to be markedly lower than that documented in two previous surveys

of dementia services conducted in 15 European countries (44%-56% of services)[12] and in the United Kingdom (65% of services)[32]. It is also important that CCDDs provide information material, possibly culturally adapted and translated into the main languages spoken by migrants living in Italy, to raise awareness about dementia, fight stigma and negative stereotypes, and enhance health literacy among diverse individuals[9,10].

Profound geographic differences were observed across Italian regions, with CCDDs located in the South of Italy reporting a significantly lower number of referred migrants and a poorer availability of dedicated resources relative to those in the Center and North of the country. Accordingly, geographic macro-area was the main predictor of the quality of care provided by the surveyed facilities in exploratory models. These results could partly depend on the fact that fewer older migrants live in Southern Italy than in the rest of the country (even if the age pyramid of migrants is similar in the three macro-areas) (Table S3 and Figure S4). Nevertheless, it has already been shown that CCDDs operating in the South have lower resources (i.e., lower availability of psychologists) and less frequently provide a comprehensive neuropsychological assessment compared with national standards[23,33]. Interestingly, our analyses also revealed that the CCDDs that receive a higher number of migrants also provide a cognitive evaluation of better quality or, vice versa, that those services that deliver culture-sensitive care are more attractive to migrants.

Some limitations of the study are worth mentioning. The study was entirely based on data from self-administered questionnaires and the experience and perceptions of respondents. Thus, it was not possible to ascertain the validity and correctness of the provided information. The facts and figures emerging from the survey are not representative of the entire population of migrants with cognitive disorders living in Italy. Indeed, as stated above, only regular migrants have access to CCDDs[34,35]. Moreover, the survey did not focus on other health and social care settings (e.g., primary care, emergency departments, reception centers) where migrants with cognitive problems may seek medical help. Accordingly, a nationwide survey of daycare services and nursing homes will soon be launched among the activities of the ImmiDem project[21]. No information was collected on relevant attributes of migrants such as their linguistic background, migration history, literacy, education, acculturation, and socioeconomic status. Finally, the quality evaluation of the cognitive assessment of migrants was based on an arbitrary, non-validated scoring system. In particular, the preferential choice of non-verbal tests was considered a possible indicator of culture-sensitivity. Indeed, this approach may allow overcoming at least the linguistic barrier. Moreover, these tests can be adopted without the need to resort to cultural mediators. Nevertheless, it has been shown that even tests with minimal linguistic requirements (e.g., Raven's

Progressive Matrices) may suffer from culture bias and lead to diagnostic mistakes and misclassifications when used in culturally diverse populations[31,36].

The study also has several strengths. First, a high response rate (60.2%) was achieved through a widespread interaction with regional delegates, local healthcare districts and services, individual healthcare professionals. This collaborative approach also helped to start raising awareness among many stakeholders on the issue of dementia in migrants and its public health implications. Moreover, the validation of the questionnaire in pilot studies combining both quantitative and qualitative research approaches enhanced the quality of the retained information and allowed for an exploration of the topic by considering the experience of healthcare professionals already familiar with the topic.

In conclusion, the present study reports the findings of the largest national survey so far conducted about dementia in people with a migration background. It provides unique data on cognitive disorders occurring in migrants living in Italy and on the preparedness of Italian services to provide diversity-sensitive care to these individuals. Based on the gaps and barriers identified by the survey, there is the need to collect detailed information on the clinical and sociodemographic characteristics of migrants with cognitive disorders, their health outcomes, and their access to healthcare resources. It is important to develop and implement assessment tools allowing the cross-cultural cognitive examination of individuals with a migration background. Moreover, it is necessary to raise awareness about dementia among culturally diverse people and train healthcare professionals in how to provide culturally competent care and support. The ultimate goal is to reduce health inequalities, guarantee the highest standards of care, and promote the wellbeing of all people with dementia living in the country, regardless of their country of birth.

Author contributions

Marco Canevelli: conceptualisation, data curation, formal analysis, methodology, supervision, writing - original draft

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Nicola Vanacore: conceptualization, formal analysis, methodology, supervision, writing - review & editing

ImmiDem Study Network: investigation

ImmiDem Study Group: conceptualization

Competing interests

Authors have no competing interests to disclose.

Data sharing

The data that support the findings of this study are available from the corresponding author upon reasonable request. After publication, all data reported in this article will be made available on the ImmiDem website.

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Figure 1. CCDDs that completed the survey questionnaire (A). Survey response rate in each Italian region (B).

Figure 2. Boxplots depicting the distribution, at the national level and by geographic macro-area, of the number of migrants referred to CCDDs (A), the number of migrants subjected to neuropsychological assessment (B), the proportion of visits (C) and neuropsychological assessments (D) addressed to migrants in 2019.

*p<0.001 (Kruskal-Wallis test)

Figure 3. Available resources for migrants with cognitive disturbances at the surveyed CCDDs (n=343), by geographic macro-area.

*p<0.001 (Chi-square test)

Figure 4. Challenges encountered in the provision of care for migrants with cognitive disturbances based on the experience of the surveyed CCDDs (n=343).

Figure 5. Results of two logistic regression models exploring the factors associated with (A) ≥1 migrant referred to the CCDD in 2019 (vs. no migrants) and (B) a sufficient quality of the cognitive assessment of migrants (vs. insufficient/very poor quality) (bivariate dependent variables of interest).

CA: cognitive assessment

*p<0.05; **p<0.001

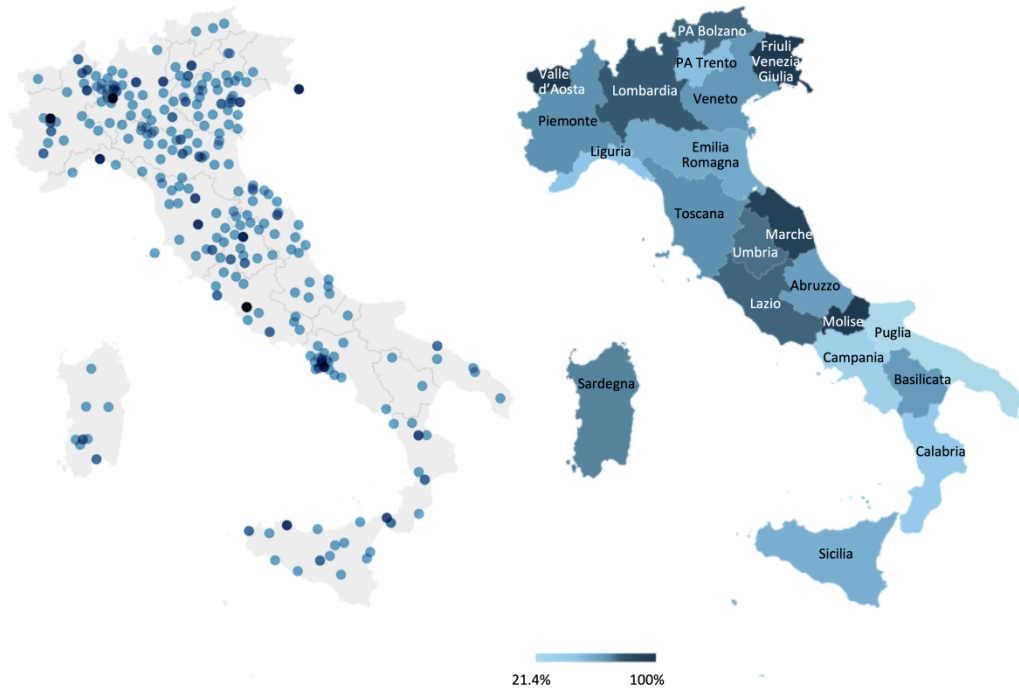**Table 1.** Characteristics, activities, and resources of CCDDs that completed the survey, by geographic macro-area.

	Overall (n=343)	North (n=161)	Center (n=96)	South (n=86)	p
Setting, n (%)					0.01[*]
Community	157 (45.8)	60 (37.3)	53 (55.2)	44 (51.1)	
Hospital	138 (40.2)	78 (48.4)	27 (28.1)	33 (38.4)	
University/IRCCS	48 (14.0)	23 (14.3)	16 (16.7)	9 (10.5)	
Opening days/week (n)					
median (IQR)	4 (2-5)	4.5 (2-5)	3 (1-5)	4 (2-5)	<0.01[§]
Overall patients referred to the CCDD in 2019 (n)					
total	263,891	137,920	69,695	56,276	
median (IQR)	500 (243-1,000)	600 (275-1,057)	500 (221-948)	400 (200-855)	0.07[§]
Migrants referred to the CCDD in 2019 (n)					
total	4,527	2,841	1,182	504	
median (IQR)	5 (1-15)	8 (3-20)	5 (1-12)	0 (0-5)	<0.001[§]
Referrals of migrants out of total referrals in 2019 (%)					
median (IQR)	1.1 (0.1-2.8)	1.5 (0.6-3.1)	1.1 (0.2-4.0)	0.0 (0.0-1.6)	<0.001[§]
Overall NP assessments in 2019 (n)					
total	120,515	54,694	34,794	31,027	

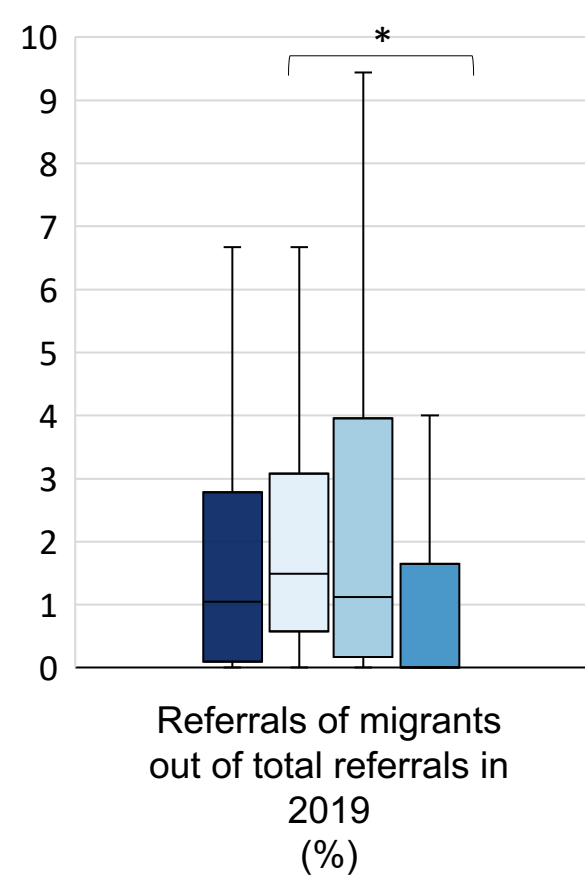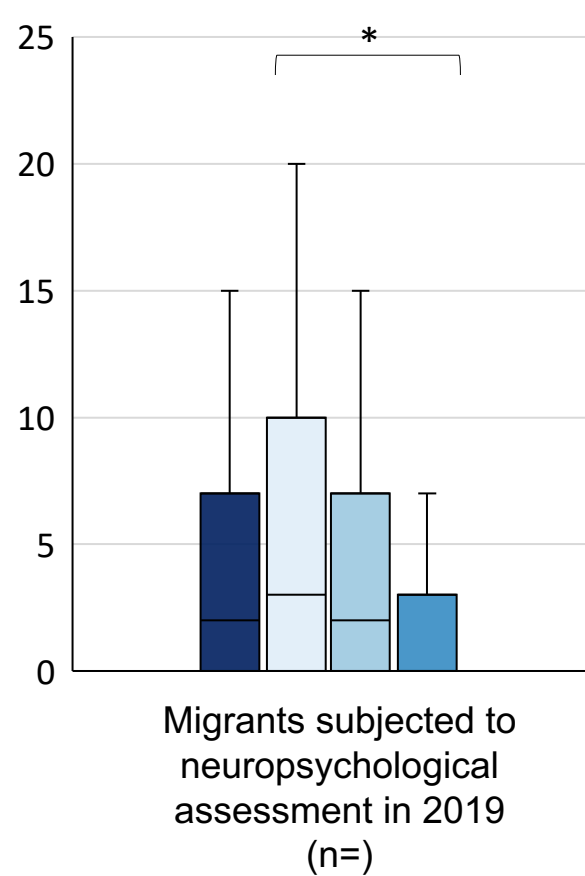|					
median (IQR)	200 (80-453)	200 (80-500)	150 (48-425)	200 (97-457)	0.48[§]
NP assessments of migrants in 2019 (n)					
total	2,040	1,151	579	310	
median (IQR)	2 (0-7)	3 (0-10)	2 (0-7)	0 (0-3)	<0.001[§]
NP assessments of migrants out of total assessments in 2019 (%)					
median (IQR)	0.9 (0.0-3.0)	1.3 (0.0-3.6)	0.7 (0.0-4.0)	0.0 (0.0-1.6)	<0.001[§]
At least one migrant referred to the CCDD, n (%)	259 (75.5)	142 (88.2)	76 (79.2)	41 (47.7)	<0.001[*]
Referrals of migrants over the last 5 years, n (%)					<0.001[*]
Stable	199 (58.0)	81 (50.3)	50 (52.1)	68 (79.1)	
Increased	130 (37.9)	74 (46.0)	44 (45.8)	12 (14.0)	
Decreased	14 (4.1)	6 (3.7)	2 (2.1)	6 (6.9)	
Availability of translated information material, n (%)	23 (6.7)	21 (13.0)	1 (1.0)	1 (1.2)	<0.001[*]
Availability of translated cognitive tests, n (%)	38 (11.1)	20 (12.4)	8 (8.3)	10 (11.6)	0.59[*]
Speaking any foreign language, n (%)	227 (71.2)	109 (72.7)	68 (73.9)	50 (64.9)	0.38[*]
Presence/availability of cultural mediators, n (%)	128 (37.3)	82 (50.9)	34 (35.4)	12 (14.0)	<0.001[*]
Presence/availability of interpreters, n (%)	36 (10.5)	29 (18.0)	5 (5.2)	2 (2.3)	<0.001[*]
Presence/availability of social-care workers, n (%)	225 (65.6)	105 (65.2)	65 (67.7)	55 (64.0)	0.86[*]
Presence of staff members with a migration background, n (%)	26 (7.6)	23 (14.3)	2 (2.1)	1 (1.2)	<0.001[*]
Accuracy of cognitive assessment of migrants, n (%)					<0.001[*]
None	64 (18.7)	20 (12.4)	15 (15.6)	29 (33.7)	

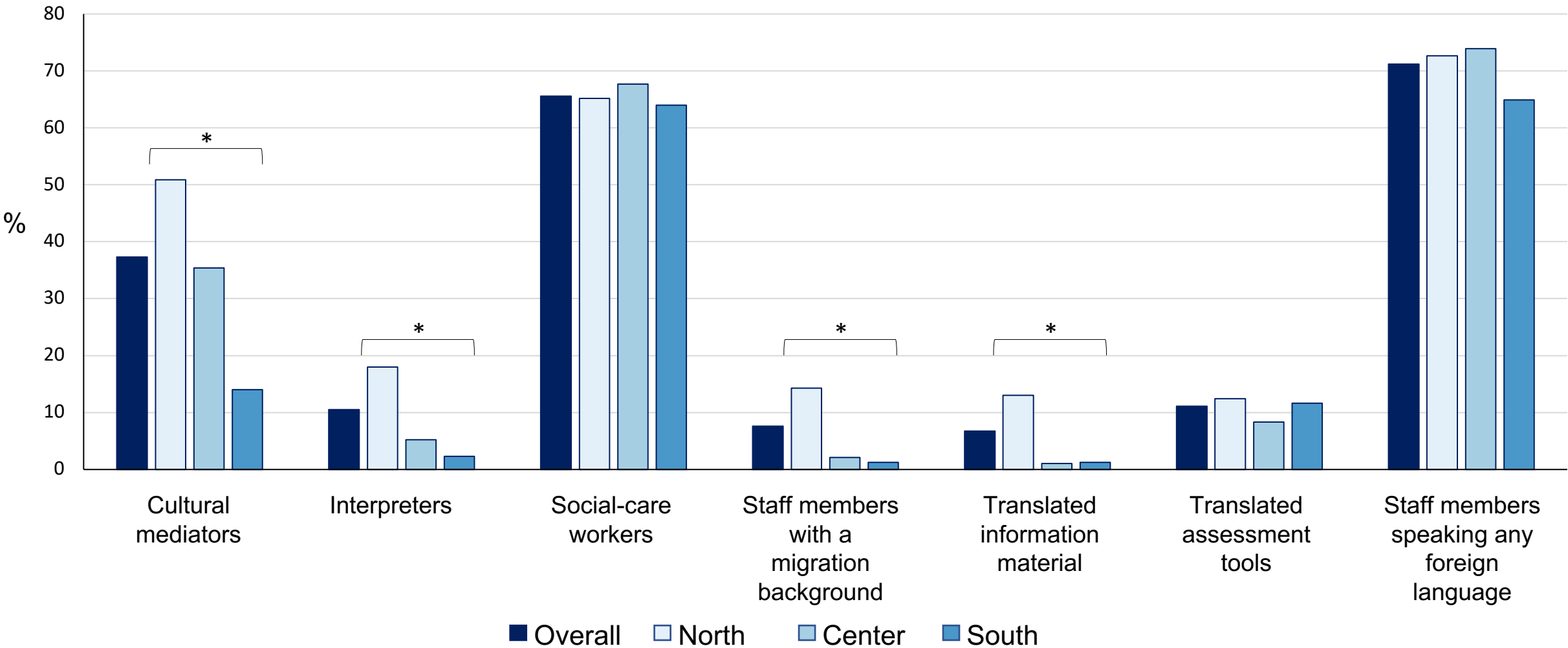|					
Insufficient	142 (41.4)	63 (39.1)	43 (44.8)	36 (41.9)	
Sufficient	137 (39.9)	78 (48.5)	38 (39.6)	21 (24.4)	
Culture-sensitivity of cognitive assessment of migrants, n (%)					<0.001*
Poor	284 (82.8)	121 (75.2)	80 (83.3)	83 (96.5)	
Partial	51 (14.9)	34 (21.1)	15 (15.6)	2 (2.3)	
Sufficient	8 (2.3)	6 (3.7)	1 (1.1)	1 (1.2)	
Overall quality of cognitive assessment of migrants, n (%)					<0.001*
Very poor	64 (18.7)	20 (12.4)	15 (15.6)	29 (33.7)	
Insufficient	234 (68.2)	113 (70.2)	67 (69.8)	54 (62.8)	
Sufficient	45 (13.1)	28 (17.4)	14 (14.6)	3 (3.5)	
Adoption of a different approach to diagnose dementia in migrants relative to natives, n (%)	26 (7.6)	10 (6.2)	12 (12.5)	4 (4.7)	0.09*
Dementia in migrants as a priority for the service, n (%)	85 (24.8)	40 (24.8)	27 (28.1)	18 (20.9)	0.53*

*Chi-square test. §Kruskal-Wallis test

CCDD: Center for Cognitive Disorders and Dementia; IRCCS: Scientific Institute for Research, Hospitalization and Healthcare; NP: neuropsychological.

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Migrants
referred to the
service in 2019
(n=)

Migrants subjected to
neuropsychological
assessment in 2019
(n=)

Referrals of migrants
out of total referrals in
2019
(%)

NP assessments of
migrants out of total
assessments in 2019
(%)
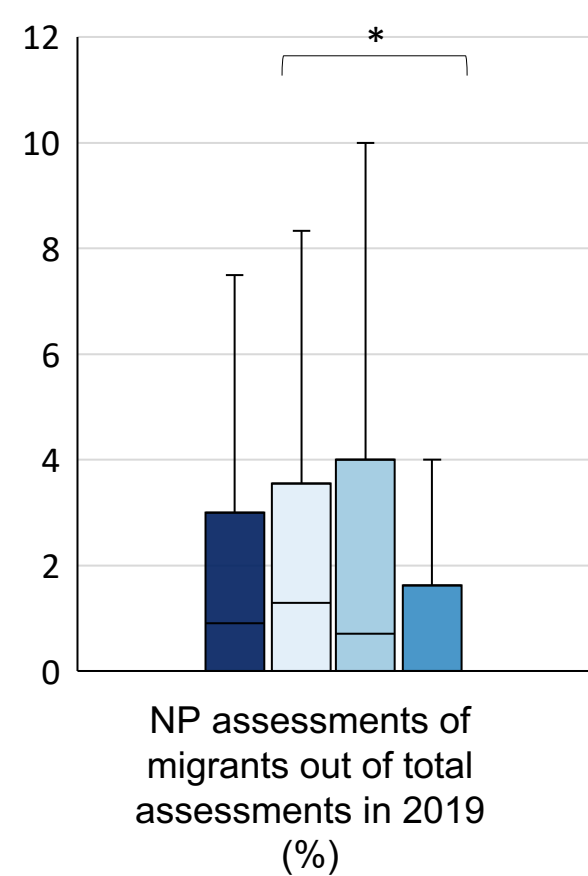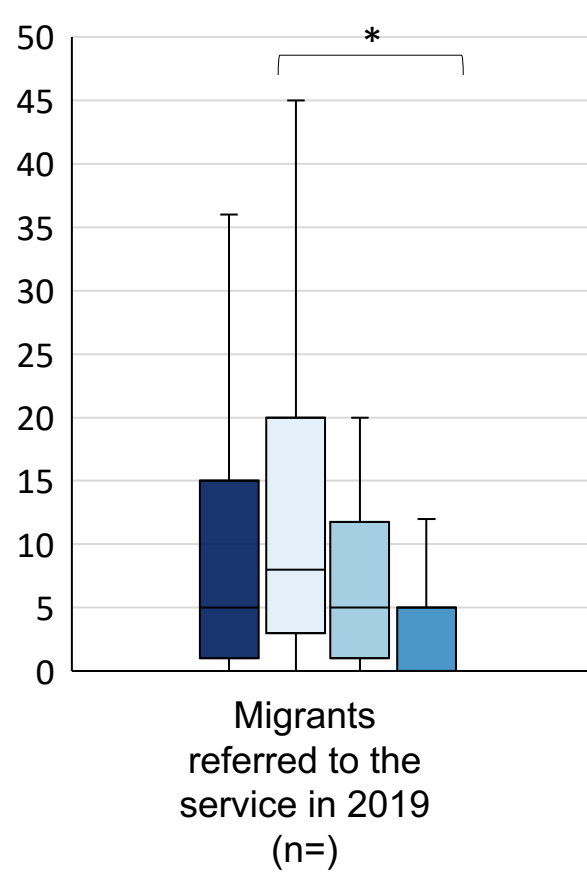
■ Overall □ North ■ Center ■ South

Category	%
Formulation of a diagnosis	~45
Communication of the diagnosis	~59
Family involvement	~52
Caregiver's support	~39
BPSD management	~21
Pharmacological treatments	~12
Follow-up	~40

%

A

	OR (95%CI)
Center (vs North)	0.52 (0.22-1.24)
South (vs. North)	0.23 (0.10-0.55)**
Hospital (vs. Community)	1.57 (0.75-3.27)
University (vs. Community)	1.68 (0.54-5.20)
Overall patients in 2019	1.00 (1.00-1.01)
Overall NP assessments in 2019	1.00 (0.99-1.01)
Increased n migrants (vs. Stable)	21.00 (4.82-91.58)**
Decreased n migrants (vs. Stable)	1.22 (0.27-5.56)
Cultural mediators	1.46 (0.68-3.13)
Interpreters	1.41 (0.37-5.43)
Staff with migration background	1.94 (0.35-10.75)
Insuff. CA quality (vs. very poor)	9.07 (4.16-19.77)**
Sufficient CA quality (vs. very poor)	8.89 (2.48-31.92)**

Odds Ratio

B

	OR (95%CI)
Center (vs North)	0.82 (0.39-1.71)
South (vs. North)	0.23 (0.06-0.84)*
Hospital (vs. Community)	0.78 (0.37-1.64)
University (vs. Community)	1.43 (0.57-3.58)
Overall patients in 2019	1.00 (1.00-1.01)
Migrants in 2019	0.98 (0.94-1.01)
Overall NP assessments in 2019	1.00 (0.99-1.00)
NP assessments of migrants in 2019	1.03 (0.99-1.08)
≥1 migrant referred to the CCDD	2.92 (0.93-9.11)
Cultural mediator	1.18 (0.60-2.32)

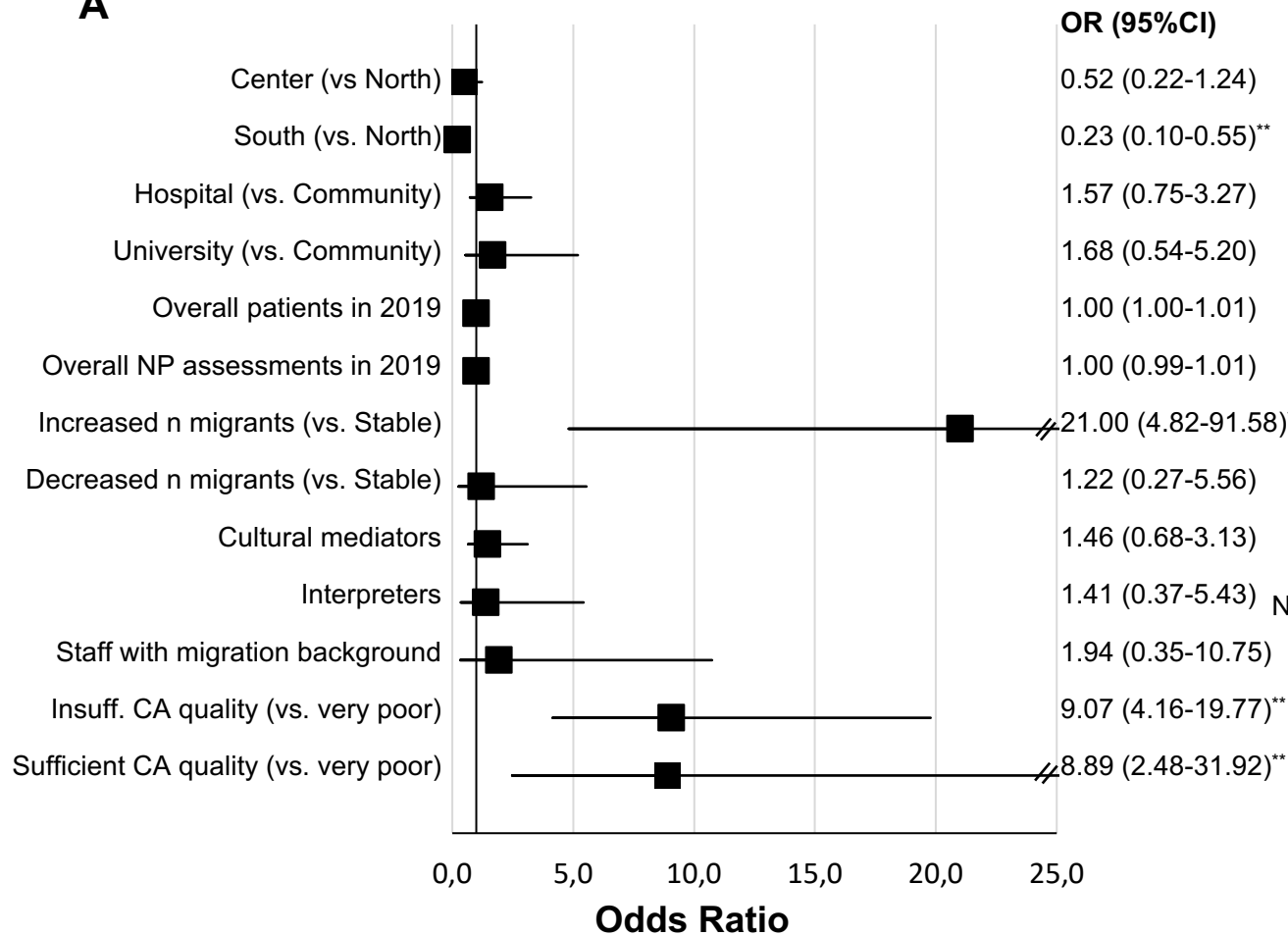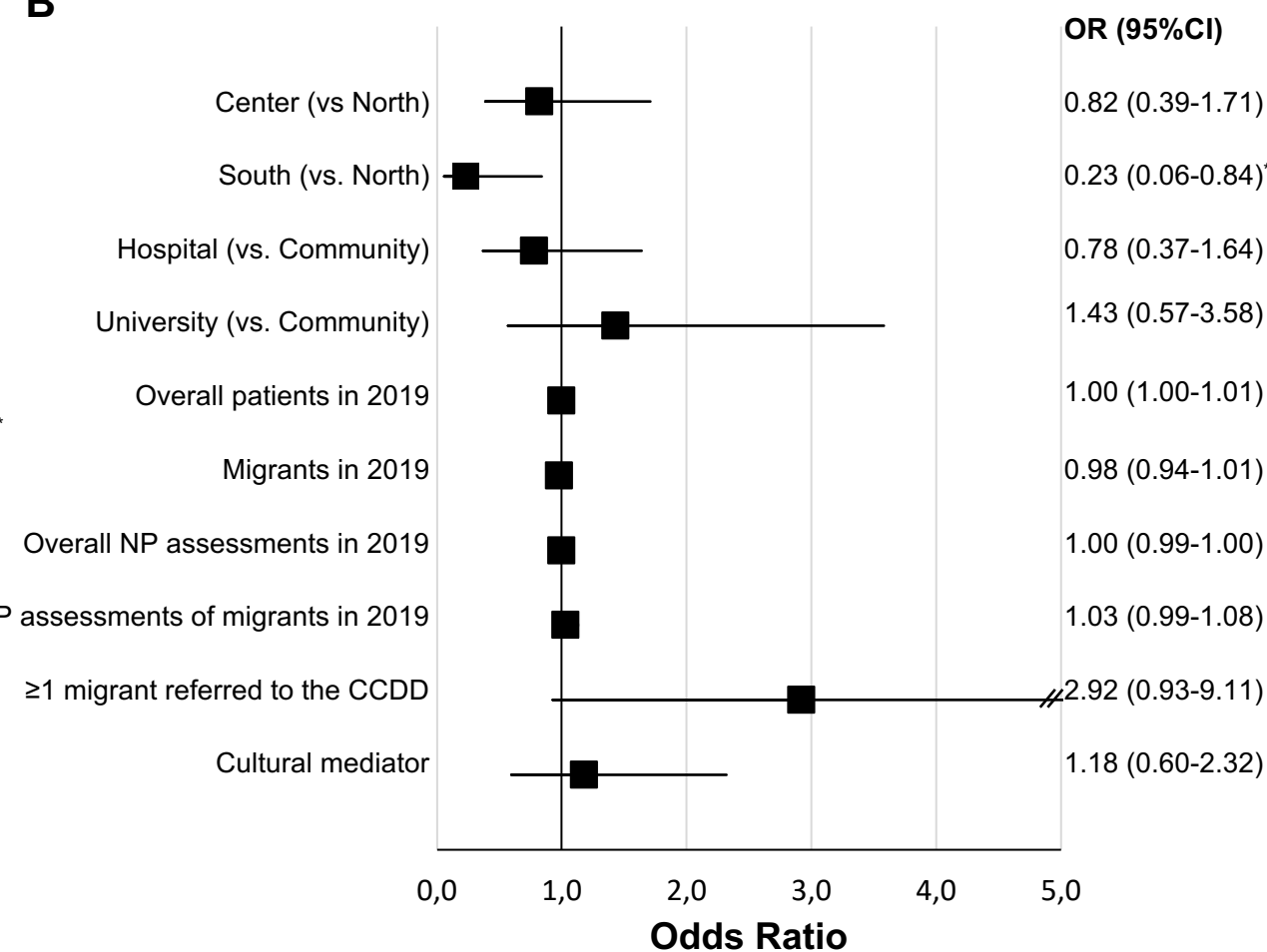**Odds Ratio**

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- Identify PD patients inadequately controlled on oral medications

- Determine which patients with PD may be adequately controlled on their current treatment regimen or may require changes to their treatment regimen

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