

# Health and social conditions of children living in disadvantaged neighborhoods in the city of Rome, Italy

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**Abstract. – OBJECTIVE:** The number of children living in socio-economically disadvantaged neighborhoods in developed countries is constantly growing, resulting in important implications for children's development, physical and psychological health and increased future disparities. In this study, we explored several key elements of children living in poor neighborhoods, such as demographic characteristics, access to public health assistance and school, and availability of housing and basic hygienic conditions.

**PATIENTS AND METHODS:** The study included 711 children aged 0-17 years referring to primary care services in the suburbs of the city of Rome, Italy.

**RESULTS:** Most children were born in Italy, while almost none of their parents were. Nearly 60% of the children did not have access to basic pediatric care, causing possible misdiagnosis and delayed treatment for acute and chronic conditions. A smaller percentage of the children did not have access to basic housing (8%) and hygienic facilities, such as heating, running water, and refrigerator (3.2%), leading to malnutrition, isolation and poor physical and psychological development.

**CONCLUSIONS:** This study confirms a critical condition for children living in disadvantaged neighborhoods, whose vulnerability is further worsened by the limited access to paediatric health assistance and, in some cases, to basic facilities with a severe impact on their physical and psychological development.

*Key Words:*

Children, Poverty, Disadvantaged neighborhoods, Primary care paediatric service.

## Introduction

The number of families living in socio-economically disadvantaged neighborhoods in developed countries is constantly growing, and consequently, the number of children growing in such condition increases<sup>1-4</sup>. According to the United States Census, a neighborhood can be considered “poor” if 20% or more of residents lack sufficient money to live at a comfortable standard<sup>1</sup>; these neighborhoods are associated with negative educational, family and labor market outcomes<sup>1-5</sup>.

Nearly 25% of the United States population lives in a poor neighborhood, with a relevant increase when compared to the past<sup>1,6</sup>. Such percentage is similar in Europe, although with a higher variability among countries<sup>7-10</sup>. Being exposed to neighborhood poverty may have important implications for children's development<sup>11,12</sup>; in fact, children that live in socio-economically disadvantaged neighborhoods can experience more stress<sup>13</sup> and violence<sup>14,15</sup>, and are more at risk of developing behavioral problems<sup>1</sup> and criminal misconduct<sup>16</sup>. Poor neighborhoods have significant effects on chances to graduate from high school<sup>17</sup>, juvenile delinquency<sup>16</sup>, substance abuse<sup>18</sup>, and teenage childbearing<sup>19</sup>. Furthermore, children growing in poor neighborhoods have fewer chances to receive proper health assistance and develop more frequently acute and chronic diseases<sup>4,20-24</sup>.

Racial and ethnic disparities also play a role among people that live in disadvantaged neighbor-

hoods. A study from Timberlake in the United States population demonstrated that African American and Hispanic children spend an average of 50% and 40%, respectively, of their first 18 years in disadvantaged neighborhoods, while white children spend less than 5% of the time in similar conditions<sup>25</sup>.

Furthermore, living in poor neighborhoods also shows an elevate continuity among generations, especially for the first and the second generation<sup>25</sup>. In fact, among newly formed low-income households that are mainly composed of immigrants, those in poor neighborhoods had higher chances to remain in these neighborhoods for 15-20 years<sup>26</sup>. This is also confirmed by Li et al<sup>1</sup> that found that about half of the children born in poor families also resided in a poor neighborhood at any time between birth and the age of 18 years and that over 33% of these children lived in a poor neighborhood both at birth and in adolescence.

In this study, we explored several key elements of children living in socio-economically disadvantaged neighborhoods in the city of Rome, Italy. They included demographic characteristics, with special attention to the country of origin of the children and their parents, access to public health assistance and school, and availability of housing and basic hygienic conditions such as heating, food refrigeration, and running water.

## Patients and Methods

The study was performed between September 2019 and July 2020 and included 711 children living in socio-economically disadvantaged neighborhoods referring to primary care services dedicated to fragile patients. The first was the Madre di Misericordia Primary Care Center located in the Vatican City State and its mobile healthcare facilities including an advanced mobile medical unit and an ambulance used to reach poor neighborhoods; the second is the Medicina Solidale Center, located in a suburban area of the city of Rome, Italy.

For each patient, a pediatrician compiled through an interview with the child and parents a clinical-anamnestic record with details on the following items: demographic characteristics, social integration and family habits, and housing conditions. Collected data were manually entered into a database for each child.

Demographic characteristics included name, age, sex, weight and length at birth, as well as details on country of birth of children and parents.

Social integration and family habits investigated school attendance, regular access to pediatric health

services, oral hygiene, and smoking habits in the family.

Questions on housing conditions investigated the availability of a house for the family, presence of hygienic services, heating system, refrigerator, and running water.

A basic health assessment with a general medical examination was then performed, with an evaluation of vital parameters and acute or chronic pathologic conditions, and prescription of drugs when necessary.

## Results

### *Demographic Characteristics*

Seven hundred-eleven children were included in the study over an 11-month period. Four hundred-five children were males (57%), 306 were females (43%).

Age ranged from 0 to 17 years. Two hundred eighty-four children were aged between 0 and 3 years and represented the largest percentage of our sample (39.9%), followed by children aged 6-10 years (179, 25.2%), 11-13 years (113, 15.9%), 14-17 years (72, 10.1%), and 4-5 years (63, 8.9%).

Weight at birth ranged between 2.8 and 3.5 kg (normal range 2.5-4.8 kg); length at birth ranged between 47 and 52 cm (normal range 45.7-60 cm). Both were within the normal range. The demographic data of our sample are shown in Figure 1.

### *Country of Origin*

The country of origin of children and their parents was investigated. The large majority of children was born in Italy (672, 94.5%), while a minority was born in a different country, mainly coinciding with that of the parents (39, 5.5%).

Differently, Italy was the country of origin only for 1.4% of the parents (10), while the majority was born in a different country (98.6%). Among them, the largest part came from countries in Eastern Europe (394, 56.2%), followed by Africa (296, 42.2%) and South America (11, 1.6%). The most represented countries of origin for parents were Romania (302, 42.5%) and Nigeria (219, 30.8%). Detailed data on parents' countries of origin are shown in Figure 2.

### *Social Integration and Family Habits*

All children aged 6 or more (n=364) in our sample were regularly attending public school. Only 67.1% of children in preschool age (n=233) attended kindergarten, while 32.9% (n=114) did not (Figure 3).

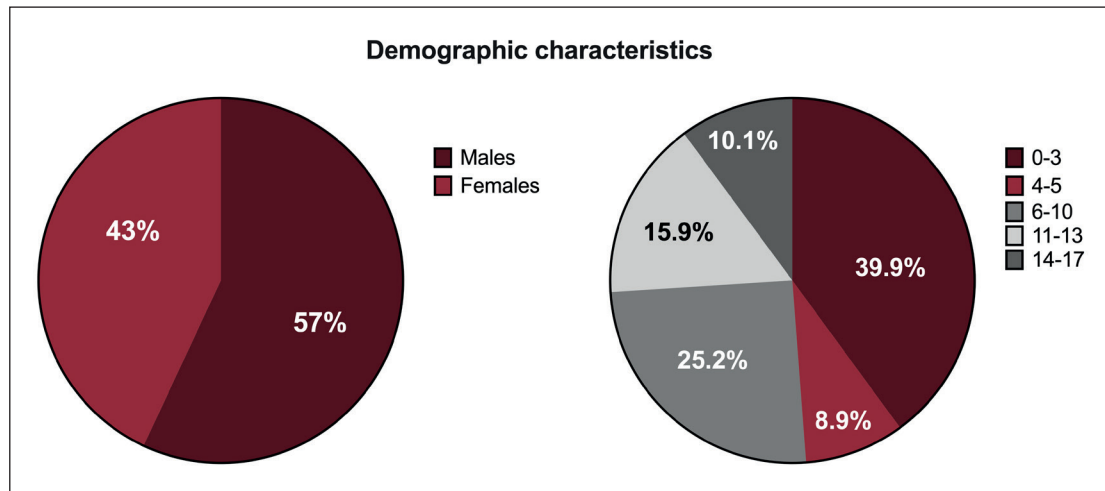


Figure 1. Demographic data of our sample for gender (A) and age (B).

Regular access to public primary care pediatric service was confirmed only for 313 children (44%), while the remaining 398 (56%) did not have access to primary pediatric care, and therefore did not have health assistance to treat pathologic conditions, but also to perform regular check-ups and monitor the growth of the child.

Oral hygiene was investigated through a basic evaluation of the oral cavity and asking the children and their parents about their oral hygiene habits. The majority of the children washed their teeth at least once a day (538, 75.7%), while 173 (24.3%) did not. The basic evaluation found caries of one or more dental elements in 298 children (41.9%), while the remaining 413 children (58.1%) did not have evident tooth decay.

Smoking within the family was also investigated, as passive exposure to cigarette smoke is known to favor acute and chronic respiratory conditions, such as asthma and tonsillitis<sup>27-29</sup>. The majority of parents (68.1%) used to smoke when at home; among them, over 50% smoked between 20 and 40 cigarettes per day.

Information on social integration and family habits are shown in Figure 4.

### Housing Conditions

Questions on housing conditions investigated the availability of a house for the family, the presence of hygienic services, heating system, refrigerator, and running water.

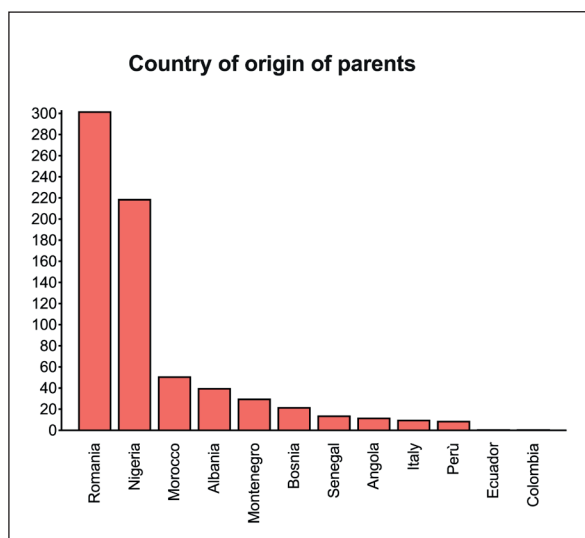


Figure 2. Details of parents' countries of origin.

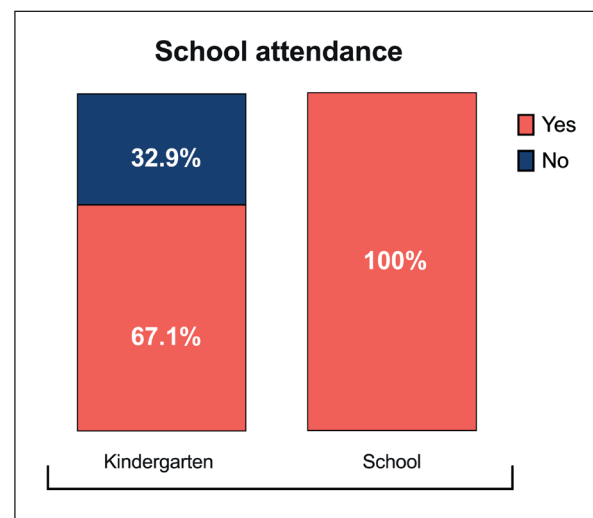
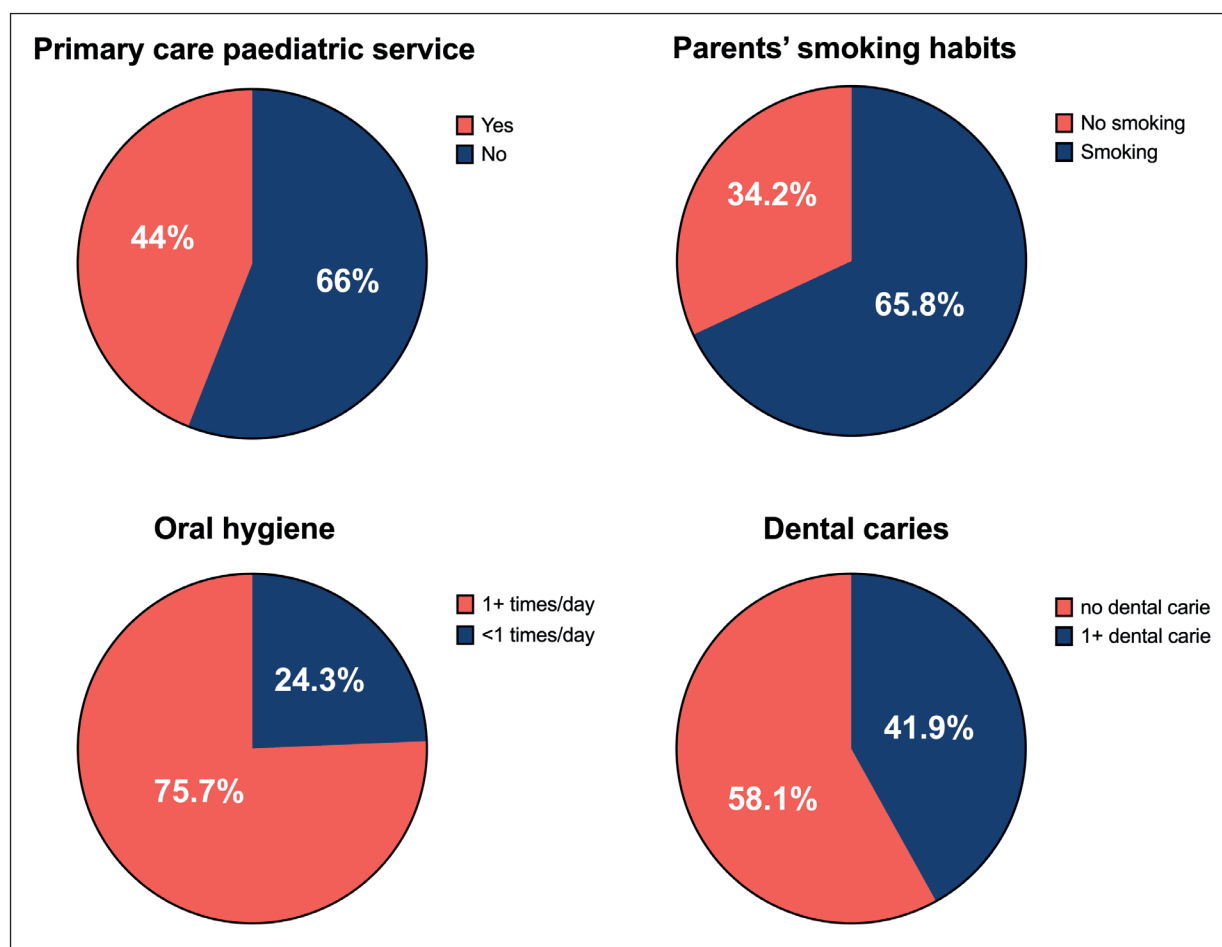


Figure 3. School and kindergarten attendance percentages for children in our sample.



**Figure 4.** Information on social integration and family habits in our sample.

The largest percentage of children included in our sample had a house (654, 92%), while 57 children (8%) lived in precarious housing conditions such as shelters or encampments.

A large percentage (96.1%, n=681) of children had access to basic hygiene facilities and running water. Similarly, heating was available for most of the children (688, 96.8%), while 23 children and their families (3.2%) did not have access to heating. The same percentages were found for the availability of a refrigerator for proper food conservation (96.8% vs. 3.2%). Details on housing conditions are shown in Figure 5.

### Health Status Assessment and Treatment

A basic health assessment was performed in all children. In nearly 30% of cases, no acute or chronic pathologic conditions were found. The most common pathology diagnosed was acute pharyngitis/ad-enotonsillitis (160, 22.5%), followed by acute otitis media (43, 6%), gastrointestinal infection (38, 5.3%),

bacterial or viral conjunctivitis (24, 3.4%), rhinitis (13, 1.8%), infectious diseases (9, 1.3%), dermatitis (8, 1.1%) and traumatic injury (6, 0.8%).

When necessary, first aid drugs were administered to children. A total of 490 drug boxes were administered; the most common was Vitamin D (143, 29.2%), followed by antibiotics (78, 15.9%), Paracetamol (73, 14.9%), Non-steroidal anti-inflammatory drugs – Ibuprofen (61, 12.4%), Iron Supplements (49, 9.8%), Aerosol corticosteroids (45, 9.2%), and probiotics (42, 8.6%). Details on common pathological conditions and administered drugs are available in Figure 6.

### Discussion

This study evaluated socio-economic conditions, health status and family environment in children in socio-economically disadvantaged neighborhoods in the city of Rome, Italy.

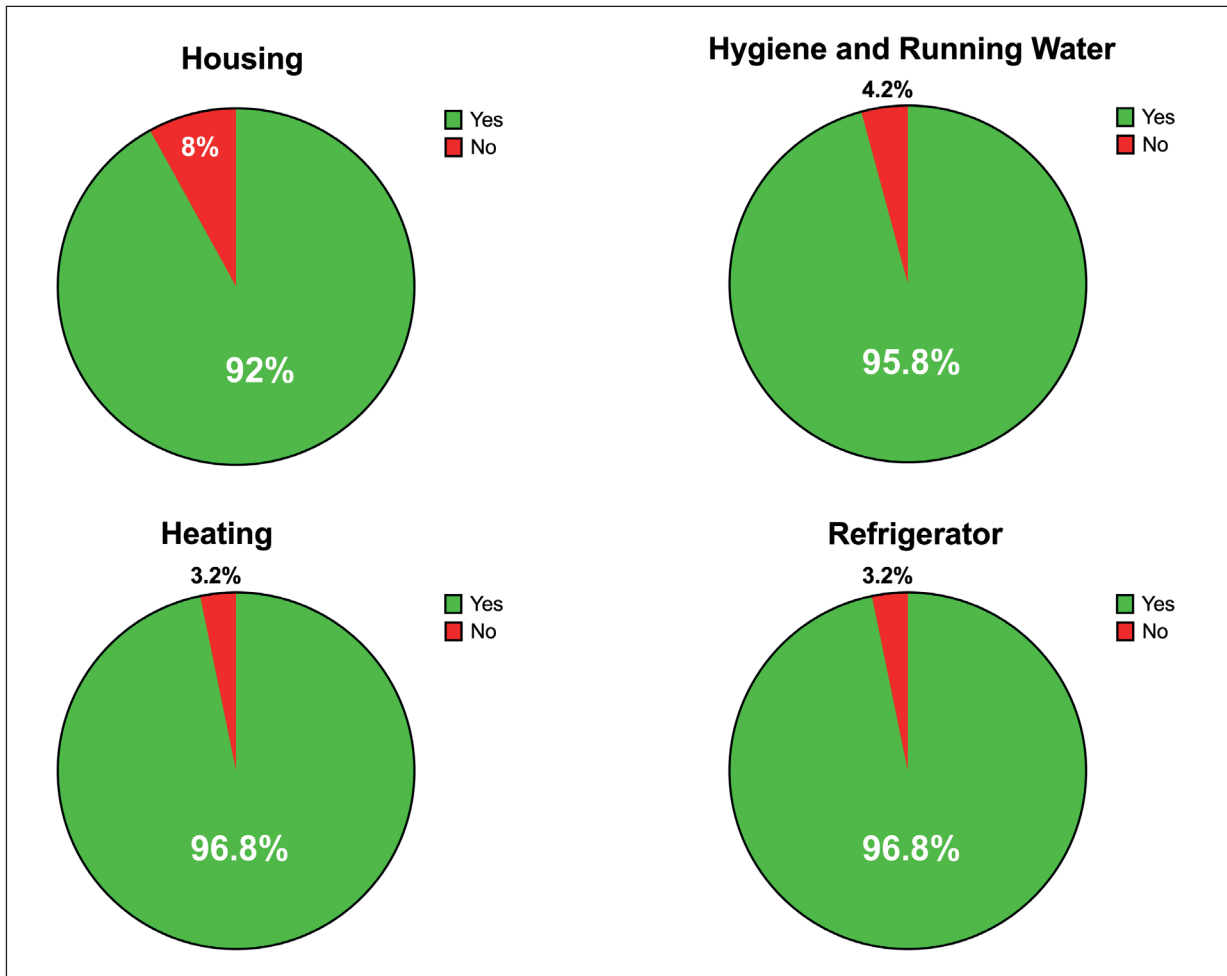


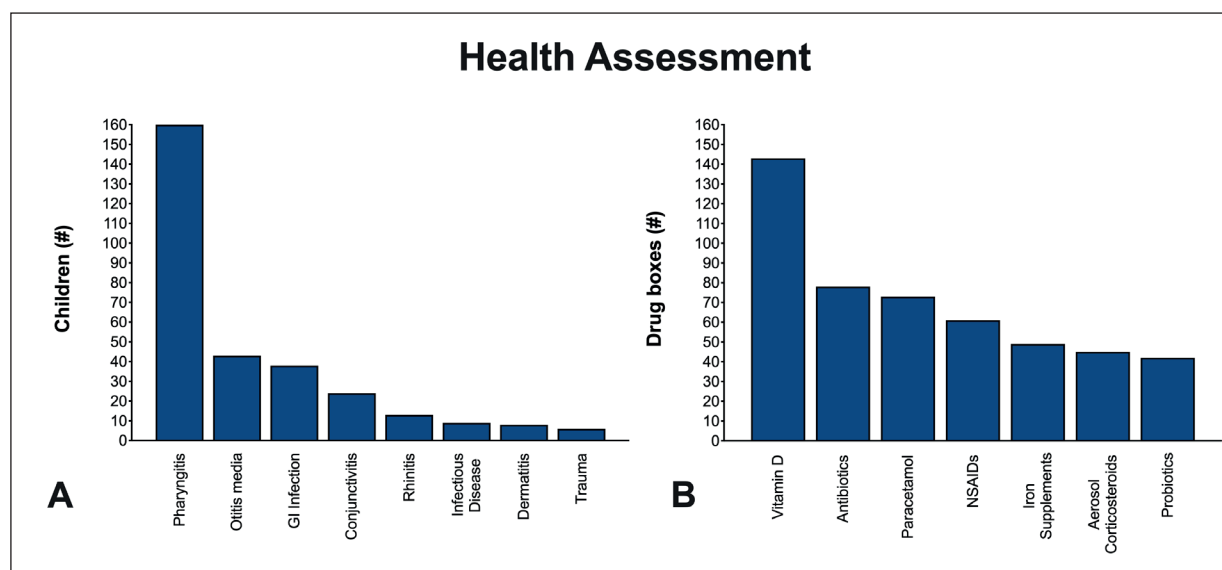
Figure 5. Details on housing conditions in our sample.

The primary care services included in this study, consisting in clinics and mobile healthcare facilities used to reach poor neighborhoods, are characterized by a low-access threshold. The approach to children in these facilities embraces the definition of the World Health Organization, “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”<sup>30</sup>. Therefore, a good health status requires the interdependence between the body, the mind and society, including the person as a whole in all its complexity and with regard to the context in which the person lives. When approaching the health of an individual, and especially of a child, it is therefore necessary to transcend the strictly medical-health level and consider the whole of social, economic and cultural factors that build the subjective experience<sup>30</sup>.

Children have needs that are particularly linked to their physical and psychological development and,

more than other groups of the population, they have specific housing, hygienic and nutritional needs, essential to prevent diseases that could represent a serious threat to health and affect their physical and psychological development. Based on the results of our study, the majority of children had a house and had access to basic hygienic and nutritional needs, such as heating and refrigerators. However, it should be noted that a portion of the enrolled children did not have access to these facilities, leading to malnutrition, acute and chronic diseases, and poor physical and psychological development. These children should not be left behind, also in the light of the United Nation Sustainable Development Goals that, through the pledge to “Leave No One Behind”, represent a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030.

Another relevant issue that we observed in our study sample was the lack of primary care paediatric



**Figure 6.** Details on common pathological conditions (A) and administered drugs (B) in our sample.

atric assistance for a significant portion of the children. The primary care pediatric service of the national health system represents a link between the families and the health service and guarantees access to basic levels of treatment, including continuative assistance accompanying children and their families throughout the stages of development<sup>31-35</sup>. Children that do not access primary pediatric care may experience several problems, such as a delayed diagnosis of acute and chronic diseases, as well as that of learning difficulties, cognitive retardation, or other conditions that may have a severe impact on their physical, psychological and cognitive development. Furthermore, the absence of continuity in the medical evaluation may lead to difficulty in identifying the first signs of anomalies or in the evaluation of whether a symptom should be cause for concern or if it is something that will resolve spontaneously without further treatment<sup>32,34,35</sup>.

The country of origin of the children' parents is another focus of this study, as it represents a concrete risk for poverty. This study confirms that almost all of the children were born in Italy from foreign parents. This was largely expected; in fact, according to the 2016 Eurostat report, the risk of poverty for children in the European Union who had at least one parent with foreign citizenship was nearly 35%, almost twice as high than it was for children whose parents were both nationals (18.8%)<sup>10,36-38</sup>. This pattern was common to all European countries except for Latvia, Poland, Bulgaria, and Hungary. The highest risk of poverty for children who had at least one parent with

foreign citizenship was recorded in Sweden (58.1%), Spain (57.5%), and Lithuania (55.8%). In Italy, the risk of poverty was nearly 45% for children who had at least one parent with foreign citizenship and 23.8% for children whose parents were both nationals. Both were higher than the average of the European Union<sup>10</sup>.

## Conclusions

This study provided a transversal overview on several key elements of children living in socio-economically disadvantaged neighborhoods, such as demographic characteristics, availability of health services, and access to basic housing and hygienic facilities. An important point was the lack of basic paediatric assistance for a significant portion of the children, leading to possible misdiagnosis and delayed treatment for acute and chronic conditions. The other relevant finding was that a small – but still present – portion of the children did not have access to basic housing and hygienic facilities, such as heating, running water and refrigerator, leading to malnutrition, risk of development of acute and chronic diseases, and poor physical and psychological development. These children should never be left behind, also in the light of the United Nations Sustainable Development Goals. The guarantee of these needs, although expressed in international and national regulatory frameworks, is often forgotten, leading to the failure of the activity of those who should represent and defend the rights of the most vulnerable.

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## Conflict of Interests

The authors declare that they have no conflict of interest.

## References

- 1) Li M, Johnson SB, Newman S, Riley AW. Residential mobility and long-term exposure to neighborhood poverty among children born in poor families: a U.S. longitudinal cohort study. *Soc Sci Med* 2019; 226: 69-76.
- 2) Kavanagh AM, Aitken Z, Emerson E, Sahabandu S, Milner A, Bentley R, LaMontagne AD, Pirkis J, Studdert D. Inequalities in socio-economic characteristics and health and wellbeing of men with and without disabilities: a cross-sectional analysis of the baseline wave of the Australian Longitudinal Study on Male Health. *BMC Public Health* 2016; 16: 1042.
- 3) Bradshaw D, Jay S, McNamara N, Stevenson C, Muldoon OT. Perceived discrimination amongst young people in socio-economically disadvantaged communities: Parental support and community identity buffer (some) negative impacts of stigma. *Br J Dev Psychol* 2016; 34: 153-68.
- 4) COMPERNOLLE S, DE COCKER K, ABBOTT G, VERLOIGNE M, CARDON G, DE BOURDEAUDHUIJ I, BALL K. Do sedentary behaviors mediate associations between socio-demographic characteristics and BMI in women living in socio-economically disadvantaged neighborhoods? *Int J Behav Nutr Phys Act* 2015; 12: 48.
- 5) DIEZ ROUX AV. Investigating neighborhood and area effects on health. *Am J Public Health* 2001; 91: 1783-1789.
- 6) LEVENTHAL T, BROOKS-GUNN J. Changes in neighborhood poverty from 1990 to 2000 and youth's problem behaviors. *Dev Psychol* 2011; 47: 1680-98.
- 7) SALMI H, KUISMA M, RAHIALA E, LAAPERI M, HARVE-RYTSALA H. Children in disadvantaged neighbourhoods have more out-of-hospital emergencies: a population-based study. *Arch Dis Child* 2018; 103: 1048-1053.
- 8) ASENSIO A, NEBOT L, ESTRUGA L, PEREZ G, DIEZ E. [Contraception in the Roma population living in two low-income neighborhoods of Barcelona (Spain)]. *Gac Sanit* 2019; 33: 119-126.
- 9) TANGGAARD ANDERSEN P, HOLST ALGREN M, FROMSEJER HEIBERG R, JOSHI R, KRONBORG BAK C. Social network resources and self-rated health in a deprived Danish neighborhood. *Health Promot Int* 2018; 33: 999-1009.
- 10) EUROSTAT EC. Higher poverty risk for children with foreign parents, 2016.
- 11) KIM Y, LEE S, JUNG H, JAIME J, CUBBIN C. Is neighborhood poverty harmful to every child? Neighborhood poverty, family poverty, and behavioral problems among young children. *J Community Psychol* 2019; 47: 594-610.
- 12) VAN VUUREN CL, REIJNEVELD SA, VAN DER WAL MF, VERHOEFF AP. Neighborhood socioeconomic deprivation characteristics in child (0-18 years) health studies: a review. *Health Place* 2014; 29: 34-42.
- 13) TAN M, MAMUN A, KITZMAN H, MANDAPATI SR, DODGEN L. Neighborhood disadvantage and allostatic load in African American women at risk for obesity-related diseases. *Prev Chronic Dis* 2017; 14: E119.
- 14) AHERN J, CERDA M, LIPPMAN SA, TARDIFF KJ, VLAHOV D, GALEA S. Navigating non-positivity in neighbourhood studies: an analysis of collective efficacy and violence. *J Epidemiol Community Health* 2013; 67: 159-65.
- 15) SAMPSON RJ, RAUDENBUSH SW, EARLS F. Neighborhoods and violent crime: a multilevel study of collective efficacy. *Science* 1997; 277: 918-24.
- 16) SHARKEY P, SAMPSON RJ. Destination effects: residential mobility and trajectories of adolescent violence in a stratified metropolis. *Criminology* 2010; 48: 639-681.
- 17) WODTKE GT, HARDING DJ, ELWERT F. Neighborhood effects in temporal perspective. *Am Sociol Rev* 2011; 76: 713-736.
- 18) KULIS S, MARSIGLIA FF, SICOTTE D, NIERI T. Neighborhood effects on youth substance use in a South-western City. *Sociol Perspect* 2007; 50: 273-301.
- 19) SOUTH SJ, CROWDER K. Neighborhood Poverty and nonmarital fertility: spatial and temporal dimensions. *J Marriage Fam* 2010; 72: 89-104.
- 20) POON BT, HOLLEY PC, LOUIE AM, SPRINGINOTIC CM. Dental caries disparities in early childhood: a study of kindergarten children in British Columbia. *Can J Public Health* 2015; 106: e308-e314.
- 21) THORNTON LE, PEARCE JR, BALL K. Sociodemographic factors associated with healthy eating and food security in socio-economically disadvantaged groups in the UK and Victoria, Australia. *Public Health Nutr* 2014; 17: 20-30.
- 22) DUNN JR, HAYES MV, HULCHANSKI JD, HWANG SW, POTVIN L. Housing as a socio-economic determinant of health: findings of a national needs, gaps and opportunities assessment. *Can J Public Health* 2006; 97 Suppl 3: S11-15, S12-17.
- 23) O'LOUGHLIN J, PARADIS G, KISHCHUK N, BARNETT T, RENAUD L. Prevalence and correlates of physical activity behaviors among elementary schoolchildren in multiethnic, low income, inner-city neighborhoods in Montreal, Canada. *Ann Epidemiol* 1999; 9: 397-407.

- 24) QI YJ, NIU QL, ZHU XL, ZHAO XZ, YANG WW, WANG XJ. Relationship between deficiencies in vitamin A and E and occurrence of infectious diseases among children. *Eur Rev Med Pharmacol Sci* 2016; 20: 5009-5012.
- 25) TIMBERLAKE JM. Effects of household and neighborhood characteristics on children's exposure to neighborhood poverty and affluence. *Soc Sci Res* 2009; 38: 458-476.
- 26) NAU C, SCHWARTZ BS, BANDEEN-ROCHE K, LIU A, POLLAK J, HIRSCH A, BAILEY-DAVIS L, GLASS TA. Community socioeconomic deprivation and obesity trajectories in children using electronic health records. *Obesity (Silver Spring)* 2015; 23: 207-312.
- 27) RATAJCZAK A, RATAJCZAK K, FELESZKO W. A cross-sectional study of smoking behaviors and attitudes of parents in pediatric primary care settings. *Int J Environ Res Public Health* 2018; 15: 1384.
- 28) LOPEZ BLAZQUEZ M, PEREZ MORENO J, VIGIL VAZQUEZ S, RODRIGUEZ FERNANDEZ R. Impact of passive smoking on lung function and asthma severity in children. *Arch Bronconeumol* 2018; 54: 436-437.
- 29) METSIOS GS, FLOURIS AD, KOUTEDAKIS Y. Passive smoking, asthma and allergy in children. *Inflamm Allergy Drug Targets* 2009; 8: 348-352.
- 30) LEONARDI F. The definition of health: towards new perspectives. *Int J Health Serv* 2018; 48: 735-748.
- 31) BROWN CL, PERRIN EM. Obesity prevention and treatment in primary care. *Acad Pediatr* 2018; 18: 736-745.
- 32) COHIDON C, CORNUZ J, SENN N. Primary care in Switzerland: evolution of physicians' profile and activities in twenty years (1993-2012). *BMC Fam Pract* 2015; 16: 107.
- 33) BROWN J, WEEDN A, GILLASPY S. Childhood obesity management in primary care: a needs assessment of pediatricians to guide resource development. *J Okla State Med Assoc* 2014; 107: 518-522.
- 34) DAVIS DW, JONES VF, LOGSDON MC, RYAN L, WILKERSON-McMAHON M. Health promotion in pediatric primary care: importance of health literacy and communication practices. *Clin Pediatr (Phila)* 2013; 52: 1127-1134.
- 35) BARAK S, RUBINO A, GRGURIC J, GHENEV E, BRANSKI D, OLAH E, COMMITTEE EU. The future of primary paediatric care in Europe: reflections and report of the EPA/UNEPSA Committee. *Acta Paediatr* 2010; 99: 13-18.
- 36) IACOBUCCI G. Poverty, public health cuts, and brexit risk halting progress on child health, college warns. *BMJ* 2019; 364: l325.
- 37) POVLSEN L, REGBER S, FOSSE E, KARLSSON LE, GUNNARS-DOTTIR H. Economic poverty among children and adolescents in the Nordic countries. *Scand J Public Health* 2018; 46: 30-37.
- 38) FAZEL S, GEDDES JR, KUSHEL M. The health of homeless people in high-income countries: descriptive epidemiology, health consequences, and clinical and policy recommendations. *Lancet* 2014; 384: 1529-1540.