

# Daily Tackling Health Inequalities: French Child Individual-Level Deprivation Index Development and Validation

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## Research Article

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# Abstract

The purpose of this study was to develop and validate a pediatric individual-level index for deprivation, usable in clinical practice and in public health. The index had a 4 phases development: items generation with literature review and experts interviews, items reduction with steering committee consensus, index derivation with multivariate analysis, and index validation with psychometric and Pearson analysis. French Child Individual-Level Deprivation Index (FrenChILD-Index) was addressed by untrained healthcare professionals in a cross-sectional multicentric study. The deprivation burden was blindly evaluated in every domain of lifestyle by an expert. Children in need of one specific type of healthcare for deprived children were: moderately deprived. Children in need of referral to a socio-medical unit for access to healthcare were: severely deprived. The main outcome measure was the agreement between FrenChILD-Index results and expert evaluation.

Development phases produced a 12-item instrument. Validation phases were carried out in a 986 children sample. FrenChILD-Index fulfilled the Terwee validity criterion for screening instruments. For moderate deprivation, sensitivity was 96.0% [92.6; 98.7] and specificity 68.3% [65.2; 71.4]. For severe deprivation, sensitivity was 96.3% [92.7; 100] and specificity 91.1% [89.2; 92.9]. It correlated with the number of lifestyle deprived domains 0.80 [0.77; 0.83] and the amount of specific healthcare for children 0.86 [0.83; 0.88].

**Conclusions:** FrenChILD-Index is the first pediatric individual-level index of deprivation, methodologically validated in Europe. FrenChILD-Index enables individual appropriate referral for deprived children. It enables considering social determinants of health into account in epidemiological adjustment, patient sample stratification and program impact measurement.

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## Introduction

Social determinants of health have a tremendous impact on children, generating early health inequities [1–3], reinforced by further barriers in healthcare access [4]. Deprivation is known to be multidimensional, affecting every domain of living conditions: economic stability, but also education, health and healthcare, neighborhood and built environment (including housing), social and community context, and family context [5–8].

Area-based deprivation indexes have been used in Europe for children in epidemiological studies [1, 2, 4]. But this kind of index has already shown some limitations with significant discrepancies [9]. Furthermore they are less appropriate in clinical practice to tackle health inequalities in adapting individual care.

It is common for most pediatricians, regardless of their clinical practice settings, to provide care to deprived children, given the significant prevalence of economically poor children (21.0% in France, 2018) [12]. Screening for deprivation is crucial to provide effective interventions for children [13], but

pediatricians have to know how to proceed [14]. However, to our knowledge, no convenient individual-level index for child deprivation has been validated in France or in Europe.

Deprived children need several kinds of social support and healthcare [10]. In France, specific Socio-Medical Units For Access to Healthcare (SMUFAH) are located in hospitals for severely deprived patients with complex needs. These units offer several specific types of healthcare: social assessment to gain access to health insurance, free medical consultations, free medicine dispensing, physical accompaniment in healthcare, home visit because of unhealthy housing, and multidisciplinary care coordination meetings. The SMUFAH multidisciplinary care plans combine at least two of these specific types of healthcare for deprived children [11].

The aim of this study was to develop and validate a pediatric individual-level index for deprivation, usable in clinical practice and public health: French Child Individual-Level Deprivation Index (FrenChILD-Index).

## Methods

The study design included four phases: item generation, item reduction and writing, index derivation, and index validation.

For the item generation phase, a literature review was performed in October, 2013 to extract existing screening instruments for investigating deprivation, vulnerability or poverty at individual level, in PubMed (for main international references) and CAIRN (increasing exhaustiveness to articles in French). In addition, face-to-face semi-structured interviews with 13 senior experts in specific healthcare for deprived children collected their opinions on the domains to be measured, and on the complementary items to address. Interviews ended when data saturation was achieved.

For the item reduction and writing phase, a steering committee was set up. Eight of the 13 senior experts accepted to participate (one pediatrician, two nurses, two social workers, two healthcare and socio-educational managers, and one health mediator). They selected by oral consensus, relevant and acceptable items covering each dimension of social deprivation, proposed their wording and an informative appendix.

An independent reading group (one general practitioner, two pediatricians, three nurses and two social workers) validated the choice and wording of the items and appendix, via an online questionnaire with a semi-quantitative notation (from 1: total disagreement to 9: total agreement) of the wording and relevance of each question. Their agreement about appropriateness was calculated according to analysis rules [15].

For the index derivation and validation phases, 13 items judged as being appropriate or uncertain were tested, by healthcare professionals untrained in their use, on a sample of children. This sample was derived from a cross-sectional multicentric study conducted between April 2018 and October 2019, which recruited a convenient sample of children in two French university hospitals (Marseille, Nice). Children

were eligible when aged 3 to 15 years old, admitted to paediatric emergency units without life-threatening conditions or ongoing medico-legal procedures. Children could only be selected once. Only one sibling was included. Informed consent was obtained from the participant's legally authorized representative and the child him or herself when 8 years old or above. For non-French speaking children, a professional telephone interpretation service was used (ISO 13611:2014; 17100:2015). A sample size about 1,000 children was required to show a sensitivity and specificity of 80% with a 95% confidence interval (CI) and a precision of 5% for primary outcome, considering an expected prevalence of deprivation for at least 25% of the sample (one hospital being located in a deprived area) [12, 16].

The primary outcome of whole deprivation burden assessment was based on a blinded expert evaluation for each child. This expert was a trained healthcare professional working in a SMUFAH (social worker, nurse or pediatrician; with at least one year of experience caring for deprived children). He/she assessed the whole deprivation burden with several criteria: (1) the type and number of deprivation domains by following the concept of deprivation, in every domain of lifestyle at an individual level [5, 6], (2) the type and amount of specific healthcare required for deprived children (both lists mentioned in the introduction), and (3) the need for admission to SMUFAH (when at least two different types of specific healthcare for deprived children were needed) [11].

For the index derivation phase, item-internal consistency was assessed by correlating each FrenChILD-Index item with the deprivation domain they were logically related to. Items were retained if they had a significant moderate correlation (Pearson correlation coefficient  $|r| \geq 0.3$ ). Internal consistency was assessed using Cronbach's alpha coefficient. We performed two linear multiple regressions to test retained items for predicting the whole deprivation burden with: i) the number of deprivation domains affected and 2) the amount of specific healthcare needed for deprived children. For the FrenChILD-Index scoring, items were weighted on the standardized coefficients (average of the two regressions) and revised according to expert recommendations.

For the index validation phase, discriminant properties were assessed accordingly: i) at least one specific type of healthcare for deprived children = moderate deprivation; and ii) at least two specific types of healthcare for highly deprived children = severe deprivation, to be admitted to SMUFAH. Sensitivity and specificity were calculated with 95% confidence intervals.

FrenChILD-Index reproducibility was assessed via a phone call retest on a random sample (0.3%) of children after 5 to 6 months (this period was longer than schooling or health insurance applications if they had already been started). It included children in a situation perceived as stable by parents and not admitted to SMUFAH over the period and was stratified with no more than 1/3 of children without any deprivation criteria (initial FrenChILD-Index = 0).

Complete-case analysis was drawn. Statistical analysis used chi-squared, Fisher's and Student's tests, Pearson correlations, linear multiple regressions and ROC curve analyses with SPSS 20.0 (IBM, Armonk, NY, USA) and SAS 9.4 (SAS, Cary, NC, USA) softwares. Bootstrap confidence intervals were calculated

using 1,000 samples generated by unrestricted random sampling with stratification according to expert assessment (mean sample size = 624). Significance threshold was 0.05.

## Results

This study shows the development of the FrenChILD-Index and its validation by resampling following the TRIPOD guidelines [17]. Study flow chart is presented, *Fig. 1*.

In the item generation phase, 52 different items were extracted from 7 published indexes [18–24] and 13 senior expert interviews. Two indexes were excluded because one concerned child health vulnerability [25], and the other used undirected interviews and validity wasn't assessed [26]. Item generation and reduction are presented in *Supplement 1*.

In the item reduction phase, 13 items were selected by the steering committee. Items needed to: cover the six deprivation domains listed above; be understandable (included for cases of low literacy); help to develop a care plan, obtain social support or improve family habits; and be acceptable in pediatric care (simple closed and easy to translate questions). The steering committee added an appendix for professionals, so that they understood the questions in the same way, and had elements for item justification and appropriate referral for healthcare and social support.

The reading group reordered the items, and judged 10 of the 13 items to be appropriate and 3 uncertain. There was no inappropriate item.

In the index derivation phase, the cross-sectional multicentric study included 990 children. Their characteristics are presented in Table 1. Item derivation including univariate and multivariate analysis is presented in *Supplement 2*.

Twelve items were included in multiple linear regressions. The household vulnerability item was dropped because the reading group judged its appropriateness uncertain and it had no relevant correlation.

Senior experts corrected FrenChILD items weighting as little as possible to fulfill several logical conditions: (1) non-French speaking had an independent and long-lasting impact (recent migration weight was shared with non-French speaking) [27]; (2) single parenthood alone did not require assessment by a social worker; (3) homeless children or with incomplete health insurance and not knowing any social workers should be admitted to SMUFAH [11]; and (4) homelessness was a wider determinant of health than lack of health insurance (homelessness weight had to be higher).

FrenChILD-Index had no ceiling effect. Score ranged from 0 (428 children (43.4%) without any deprivation criteria) to 116 (only one child with all of the highest deprivation criteria), with a mean score of 13.1 (SD = 22.0). The median score was 4, [interquartile range: 0; 15].

In the index validation phase, expert assessment judged that 149 (15.1%) children needed at least one specific type of healthcare for deprived children and 96 (9.74%) needed multidisciplinary care in a

SMUFAH.

FrenChILD-Index was correlated with the whole deprivation burden. Its correlation with the number of deprivation domains affected and the amount of specific healthcare needed for deprived children were respectively 0.80 [95%CI: 0.77; 0.83] and 0.86 [95%CI: 0.83; 0.88] ( $p < 0.0005$ ). Cronbach's coefficient was 0.76 [95%CI: 0.73; 0.78].

The frequency of deprivation domains per FrenChILD-Index level is presented in *Fig. 2*. It was correlated with each specific type of healthcare for deprived children (all  $r \geq 0.32$ ).

The impact of FrenChILD-Index on children pathway was measured using psychometric properties. A FrenChILD-Index  $\geq 6$  screened for moderate deprivation with a sensitivity of 96.0% [95%CI: 92.6; 98.7] and specificity of 68.3% [95%CI: 65.2; 71.4].

A FrenChILD-Index  $\geq 26$  screened for severe deprivation with a sensitivity of 96.3% [95%CI: 92.7; 100] and a specificity of 91.1% [95%CI: 89.2; 92.9] (Table 2).

In the study center (2) with the lowest deprivation prevalence, FrenChILD-Index retained suitable sensitivity and specificity for moderate deprivation (96.0% [95%CI: 89.8; 100]; 74.2% [95%CI: 74.6; 83.0]) and for severe deprivation (92.9% [95%CI: 82.1; 100]; 94.4% [95%CI: 92.0; 96.7]).

FrenChILD-Index retest for 31 children was highly correlated ( $r = 0.78$ ;  $p < 0.01$ ), the mean difference was low (-0.71; SD = 7.51).

FrenChILD-Index correlated with expert assessment of children in every deprivation domain except the family context. The risk of deprivation in the family context domain was the highest (OR = 26.4 [95%CI: 10.8; 65.1]) for FrenChILD-Index from 20 to 29. Experts associated family context deprivation with unhealthy housing (OR = 2.52 [95%CI: 1.39; 4.57]) and housing instability (OR = 3.19 [1.71; 5.98]) but not with homelessness (OR = 0.93 [0.12; 7.29]). They did not associate family context deprivation with interculturality (recent migration,  $p = 0.44$ ; non-French speaking,  $p = 0.92$ ).

## Discussion

Results showed that we have successfully constructed and internally validated an original and important pediatric individual-level index for deprivation in a European country. FrenChILD-Index met all of Terwee's criteria for index validation [28].

### Content validity

The objectives, target population and concept measured were clearly described and senior experts were involved in item selection. FrenChILD-Index items significantly correlated with each corresponding domain of deprivation.

### Internal consistency

Items showed a good correlation with each other. Their weighting did not use factorial analysis proposed by Terwee. This method resulted in weightings that were not strongly enough correlated with specific healthcare needs for deprived children and deprivation dimensions, both amounts taken as references for progressivity.

### **Criterion validity**

Blinded cross-evaluation by an expert was already used by Pascal and Colvin [23, 29]. In clinical practice, experts are rarely available. Indeed the aim of FrenChILD-Index is to replace them.

### **Construct validity**

FrenChILD-Index showed how deprivation domains accumulate to threaten the appearance of early health inequalities [6, 7]. Each item significantly correlated with its deprivation domain. Most were also correlated with the number of deprivation domains and amount of specific healthcare for deprived children.

### **Individual interpretability**

FrenChILD-Index showed an excellent sensitivity and specificity for each operational cut-off (moderate  $\geq 6$  and severe deprivation  $\geq 26$ ). This allows efficient child referral (*Fig. 3, Supp3*). The appendix provided the additional information for appropriate referral. Lack of information for appropriate referral was known to be a barrier to screening [10, 30].

### **Collective interpretability**

FrenChILD-Index scaling has a sufficient number of degrees for describing various deprivation levels in a sample of children. It will enable quantitative monitoring in clinical and epidemiological research but also in actions to reduce social determinants of health. It is useful for studying early health inequalities by grouping all of the deprivation domains in a linear proportionality.

*Reliability* was good in the retest evaluation. This highlights the stability of FrenChILD-Index over time.

*A floor but no ceiling effect*, FrenChILD-Index has a floor level because it focuses on deprived children. Having no ceiling effect, it is able to describe a wide spectrum of deprivation levels.

Sokol reviewed 11 indexes derived in the USA in children but only 3 were validity assessed [5]. IHELP had a similar sensitivity and specificity in the USA [29]. PSQ was out of scope because questioning and screening concerned parental depression [31]. Six indexes questioned adverse childhood experiences. These were neither included in items nor retained as validation criteria in FrenChILD-Index. Senior experts considered that screening for deprivation (socially considered to be a condition for assistance) and addressing adverse childhood experiences (socially banned and legally prohibited) should be considered separately because the latter are deemed to be judgmental and cause response biases [32]. WHO also

distinguishes between social determinants of health assessment and reduction, and adverse childhood experiences prevention, in separate chapters of its strategy [33].

In France, Fouchard compared three adult individual-level deprivation indexes [34]. EPICES tool had the most common points with FrenChILD-Index but not all of the items were appropriate for children [22]. Furthermore, the interpretation of EPICES was expected to be more perturbed by lifestyle confounding factors than FrenChILD-Index because of items on leisure activities (e.g. as highlighted in case of access restriction).

Use of FrenChILD-Index will improve deprivation screening in clinical practice and as Garg showed, systematic screening increases appropriate referrals by more than 4 [35].

FrenChILD-Index highlighted an expert judgment bias. Experts reported less family context deprivation in cases of homelessness but not in cases of interculturality. Indeed, even for experts, homelessness raises questions about the lack of standards on how to be a good enough parent in such severely deprived living conditions.

This study had one limitation. FrenChILD-Index identified 172 severely deprived children, whereas experts retained referral to SMUFAH for only 93. SMUFAH is a relevant resource for access to healthcare. Indeed, this highlights the wider support needed for those families. However, severely deprived children suffered from deprivation in several domains and other types of social support. Economically poor children were expected to be much more frequent in emergency units [12]. Furthermore, expert evaluation is already a valuable type of care in complex living conditions [10]. FrenChILD-Index only gave 3 (0.3%) false negatives.

## Conclusion

We have developed and validated FrenChILD-Index, in response to the lack of any validated pediatric deprivation index in Europe. It is now used in France for appropriate individual referral and for epidemiological adjustment to deprivation biases and available for stratification of children samples and assessment of impact in public health interventions. It will improve professional knowledge about social determinants of health and patients' early health inequities.

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## Tables

Table 1  
Characteristics of the children

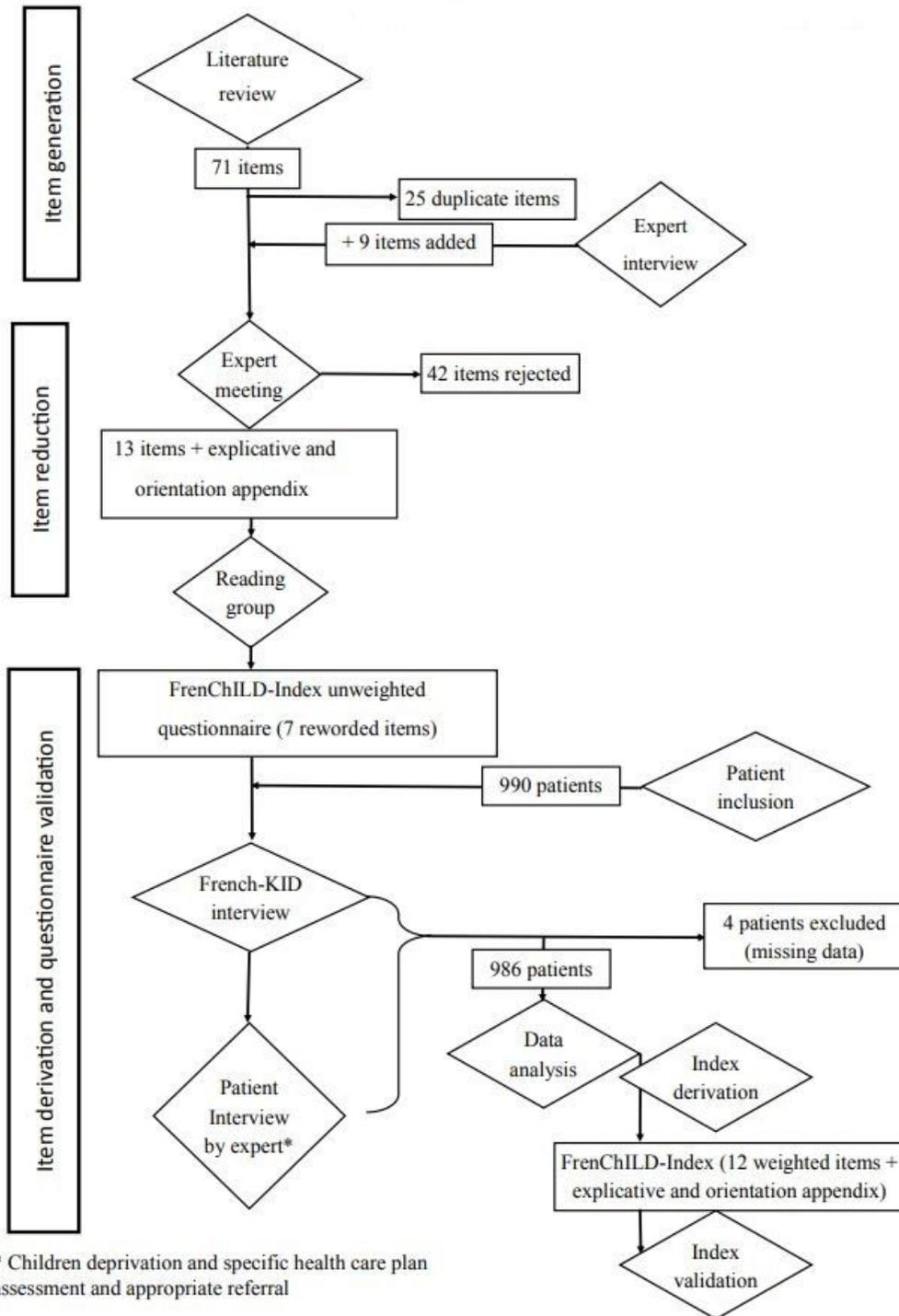
		Centre 1		Centre 2		<i>p</i>
		N	%	N	%	
		596		390		
	Sex (boys)	324	54.4%	210	53.8%	<i>0.90</i>
	Age*	8.60	(3.68)	8.65	(3.52)	<i>0.84</i>
<b>FrenChILD-Index items</b>						
(weighting to add up)	Answers					
<b>1. Do you have a medical record or vaccination document for each of your children (here or at home)?</b>						
(8)	Health booklet missing	38	6.4%	12	3.1%	<i>&lt; 0.05</i>
<b>2. Are all of your children followed (at least once a year) by a doctor (family doctor. maternal and child protection service)?</b>						
(14)	Children health follow-up missing	48	8.1%	18	4.6%	<i>&lt; 0.05</i>
<b>3. Do you have full health coverage for your child (which type)?</b>						
(0)	Full Health insurance (including a top-up policy)	326	54.7%	306	78.5%	<i>&lt; 0.0005</i>
(4)	Complete health insurance for deprived citizens	182	30.5%	59	15.1%	
(17)	Incomplete health insurance	19	3.2%	9	2.3%	
(9)	Complete health insurance for undocumented migrants	14	2.3%	3	0.8%	
(26)	No health insurance (even if enrollment in progress or insurance abroad)	55	9.2%	13	3.3%	
<b>4. Do all of your children, school-aged<sub>a</sub>, go to school?</b>						
(7)	Children unschooling	46	7.7%	9	2.3%	<i>&lt; 0.0005</i>
<b>5. Do you have a personal or family home (house. flat. room)?</b>						
(0)	Stable housing	536	89.9%	375	96.2%	<i>&lt; 0.0005</i>
(16)	Unstable housing (temporary social housing or housed by relatives. slums)	53	8.9%	10	2.6%	
(26)	Homelessness	7	1.2%	5	1.3%	

		Centre 1		Centre 2		<i>p</i>
		N	%	N	%	
<b>6. If stable housing, is it in poor condition, run down, dangerous (peeling paint, mould, risk of electric shock, trauma)?</b>						
(17)	Unhealthy housing	54	9.1%	27	6.9%	0.24
<b>7. Do you know a social worker who assists you (helps you) with your (administrative, social) procedures? If not, do you need one?</b>						
(0)	Not needing a social assistance	429	72.0%	295	75.6%	< 0.005
(6)	Needing social assistance	118	19.8%	83	21.3%	
(9)	Needing social assistance without knowing how to get this	49	8.2%	12	3.1%	
<b>8. Do you live alone with your children (single parent)?</b>						
(5)	Single parenthood	170	28.5%	85	21.8%	< 0.05
<b>9. Do you sometimes not have enough to eat?</b>						
(8)	Food insecurity	57	9.6%	22	5.6%	< 0.05
<b>10. Are there people around you that you can trust to help you (for transport, to look after the children, to enable you to go to appointments, to help with procedures)?</b>						
(9)	Surrounding dismiss	100	16.8%	25	6.4%	< 0.0005
<b>Is there a particular personal situation at home (pregnancy, stress, chronic illness, disability, dependency, violence) that could affect your children's life or health?</b>						
b	Household vulnerability	63	10.6%	33	8.5%	0.28
<b>11. Have you moved to another region (or country) in the last two years?</b>						
(2)	Recent migration	89	14.9%	34	8.7%	< 0.005
<b>12. [Evaluation by the caregiver] Are the questions, explanations to the patient limited in French?</b>						
(2)	Non-french speaking	54	9.1%	9	2.3%	< 0.0005
<b>Expert opinion</b>						
<b>Domains of deprivation</b>						
	Health and Health Care	85	14.3%	22	5.6%	< 0.0005

	Centre 1		Centre 2		<i>p</i>
	N	%	N	%	
Neighborhood and built environment	115	19.3%	32	8.2%	< 0.0005
Social and Community Context	35	5.9%	9	2.3%	< 0.05
Education	35	5.9%	9	2.3%	< 0.0005
Economic stability	134	22.5%	310	79.5%	< 0.0005
Family Context	91	15.3%	15	3.8%	< 0.0005
Number of deprivation domains affected*	0.98	(1.40)	0.34	(1.03)	< 0.0005
<b>Specific healthcare for deprived children</b>					
free medical consultations	61	10.2%	13	3.3%	< 0.0005
social evaluation to gain access to health insurance	72	12.1%	22	5.6%	< 0.005
free medicine dispensing	60	10.1%	15	3.8%	< 0.0005
home visit because of unhealthy housing	27	4.5%	29	7.4%	0.05
physical accompaniment in healthcare	17	2.9%	18	4.6%	0.14
multidisciplinary care coordination meetings	32	5.4%	25	6.4%	0.49
Admission in SMUFAH**	68	11.4%	28	7.2%	< 0.05
Amount of specific healthcare for deprived children*	0.45	(1.16)	0.31	(1.02)	0.05
* mean (standard deviation)					
** SMUFAH: specific medico-social units for access to health					
a. Schooling was mandatory in France from the age of 3 to 15 from 01.09.2019. Previously, it was mandatory from the age of 6.					
b item dropped after univariate analysis (see Supplement 2).					

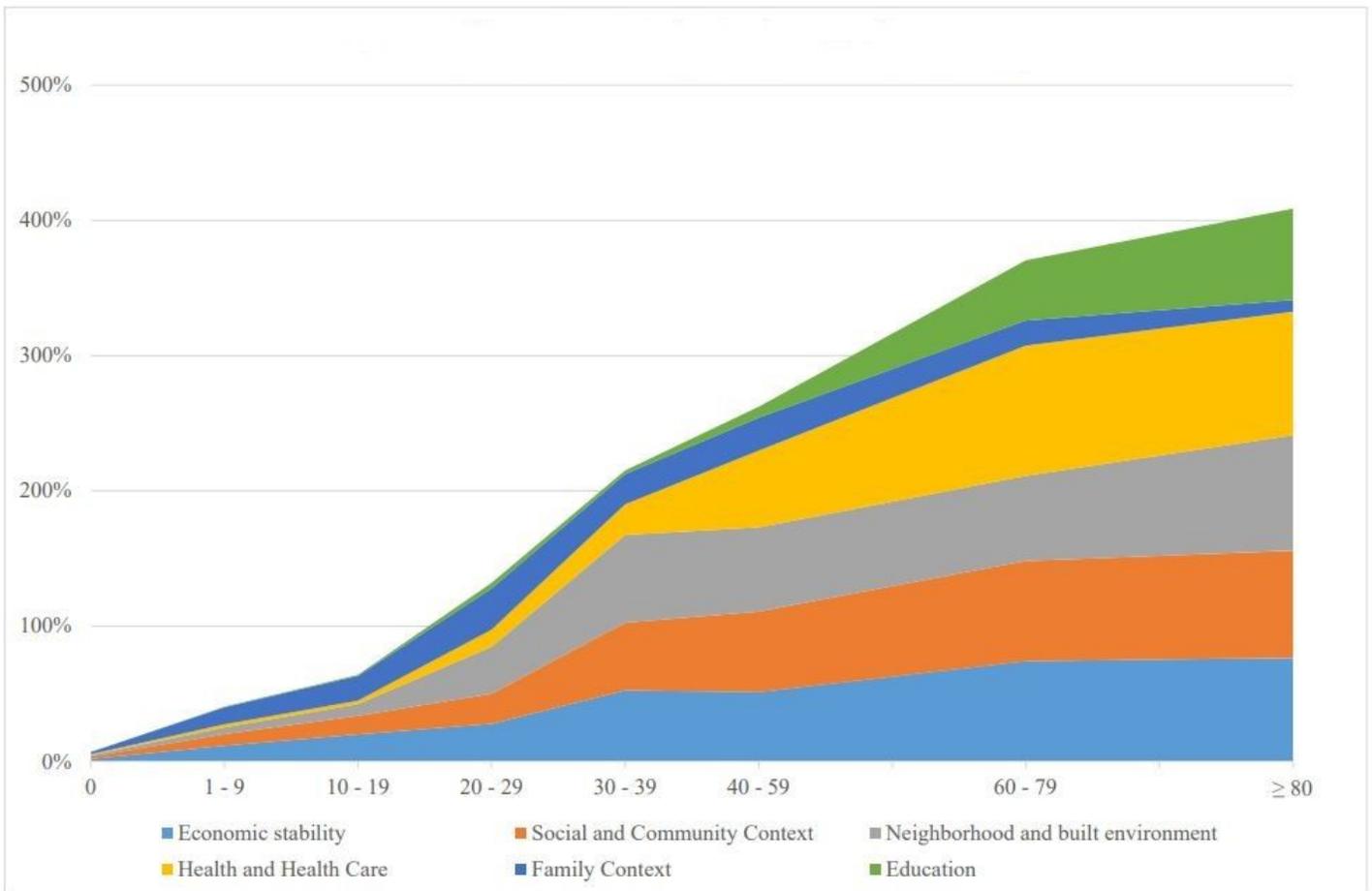
<b>Table 2. Frequency of specific healthcare for deprived children per French Child Individual-Level Deprivation Index (FrenChILD-Index) level</b>									
FrenChILD-Index	0		1–5		6–25		≥ 26		
Number of children	428		151		235		172		
At least one specific healthcare for deprived children	2	0.5%	4	2.7%	17	7.2%	126	73.3%	
Admission in SMUFAH*	0	0.0%	1	0.7%	2	0.9%	93	54.1%	
Specific healthcare for deprived children									
free medical consultations	0	0.0%	0	0.0%	0	0.0%	74	43.0%	
social evaluation to gain access to health insurance	0	0.0%	1	0.7%	6	2.6%	87	50.6%	
free medicine dispensing	0	0.0%	0	0.0%	0	0.0%	75	43.6%	
home visit because of unhealthy housing	1	0.2%	2	1.3%	7	3.0%	46	26.7%	
physical accompaniment in healthcare	1	0.2%	0	0.0%	2	0.9%	32	18.6%	
multidisciplinary care coordination meetings	0	0.0%	2	1.3%	4	1.7%	51	29.7%	
FrenChILD-Index interpretation	No or low risk of deprivation suspected				Child likely to suffer of at least one domain of deprivation in its living conditions		Child likely to suffer of complex and highly deprived living conditions		
Proposition of referral	None systematic. except specific demand				interview with a social worker		appropriate medical-social unit (SMUFAH*)		
* SMUFAH: Specific Medico-social Units For Access to Healthcare									

# Figures



**Figure 1**

French Child Individual-Level Deprivation (FrenChILD) Index development and validation flow chart [Portable Document Format from a Publisher 2013]



**Figure 2**

Piling of the deprivation domains per French Child Individual-Level Deprivation Index (FrenChILD-Index) level [Portable Document Format from an Excel 2013 Figure]

## RESOURCES IN CASES OF SOCIAL DEPRIVATION OR FOR ACCESS TO HEALTHCARE FOR CHILDREN

### Why ask these questions during medical care? Where to refer people to in case of need?

#### MEDICAL FOLLOW-UP

Systematic medical follow-up allows appropriate screening and preventive actions throughout life. The use of a health booklet is recommended. This can be obtained from the Conseil Départemental. A child should see a doctor before the age of 8 days old, then once a month until 6 months, at 9 months, 12 months, 18 months, 24 months, at 2 years, twice a year until 6 years, then once a year until adulthood.  
Resources: *GR pédiatrique, Maternal and Child Protection Service of the Conseil Départemental, Health Centre, Socio-Medical Units For Access to Healthcare in hospitals.*

#### HEALTH INSURANCE AND REMAINING FEES

It is important to adapt one's prescriptions to the risk of a patient not being able to obtain them. Some care is poorly reimbursed by health insurance (dental care, sight correction, some creams or eye drops) and require certain precautions. An interview with a social worker can provide information on health coverage, avoid billing to the patient and ensure continuity of care.  
Resources: *Caisse Primaire d'Assurance Maladie, Socio-Medical Units For Access to Healthcare in hospitals.*

#### SCHOOLING FOR CHILDREN AGED 3 TO 15

Schooling is compulsory in France for children aged 3 to 15. It promotes the learning of French, social integration and ultimately occupational integration.  
Resources: *Town Hall, School, Associations.*

#### HOUSING

Stable housing is necessary for organizing family life, pursuing school and studies, and engaging healthcare.  
Resources: *Social worker from the Conseil Départemental, Emergency Shelters Services, Associations.*

In addition to discomfort, various housing issues can cause illnesses and accidents (asthma, trauma, burns, poisoning with carbon monoxide, lead...). Several procedures are available to request rehabilitation or social rehousing, after a social or environmental assessment.  
Resources: *Town Hall, GR social workers from the Conseil Départemental, Départemental Pole against Unhealthy Housing, Associations.*

#### ACCESS TO FOOD

Food insecurity is a problem in France (> 10% of the population). Access to food and water is a prerequisite for most care prescriptions.  
Resources: *Associations, Social workers from the Conseil Départemental.*

#### RELATIVES

Assistance from family and friends is important for looking after children and organizing certain types of care and procedures (travel, administrative formalities, parenting support, medical follow-up...).  
Resources: *Social and Family Intervention Technician, Social workers from the Conseil Départemental, Social Centres, Associations.*

## French Child Individual-Level Deprivation Index screening instrument

Questionnaire for the identification of social deprivation and access to healthcare in pediatric patients

### Guide for Caregivers

Social inequalities affect health from the earliest age. To reduce them, we must first identify them. Transforming your prescription into care means adapting it to the resources of the child and their family.



## French Child Individual-Level Deprivation Index screening instrument

Child: \_\_\_\_\_ Date: \_\_\_\_\_

ITEMS	ANSWERS	
A. Do you have a medical record or vaccination document for each of your children (here or at home)?	YES: 0	NO: 8
B. Are all of your children followed (at least once a year) by a doctor (family doctor, maternal and child protection service)?	YES: 0	NO: 14
C. Do you have full health coverage for your child (which type)?	FULL HEALTH INSURANCE (including a top-up policy): 0 Free HEALTH INSURANCE for DEPRIVED CITIZENS: 4 Free HEALTH INSURANCE for UNDOCUMENTED MIGRANTS: 8	NO HEALTH INSURANCE (including if enrollment in progress or insurance abroad): 26 INCOMPLETE HEALTH INSURANCE: 17
D. Do all of your children, aged between 3 and 15 years old, go to school?	YES (or not applicable): 0	NO: 7
E. Do you have a personal or family home (house, flat, room)?	STABLE HOUSING: 0	UNSTABLE HOUSING (temporary social housing or housed by relatives, slums): 17 NO HOUSING: 26
F. If stable housing, is it in poor condition, run down, dangerous (peeling paint, mould, risk of electric shock, trauma)?	NO: 0	YES: 17
G. Do you know a social worker who assists you (helps you) with your (administrative, social) procedures? If not, do you need one?	NO: 0	YES: 9
H. Do you live alone with your children (single parent)?	NO: 0	YES: 5
I. Do you sometimes not have enough to eat?	NO: 0	YES: 8
J. Are there people around you that you can trust to help you (for transport, to look after the children, to enable you to go to appointments, to help with procedures)?	YES: 0	NO: 9
K. Have you moved to another region (or country) in the last two years?	NO: 0	YES: 2
L. [[Evaluation by the caregiver] Are the questions, explanations to the patient limited in French?	NO: 0	YES: 2
	<b>TOTAL</b>	

Total < 6

### No social deprivation

likely to threaten access to health and healthcare.  
-No referral unless specifically requested (see overleaf).

Total from 6 to 25

### Moderate social deprivation

that may threaten access to health and healthcare.  
-Propose a referral that is suited to the difficulties (see overleaf).  
-In the absence of social follow-up, evaluation and social support may be offered.

Total ≥ 26

### Severe social deprivation

likely to seriously threaten access to health and healthcare.  
-Propose an appropriate multidisciplinary referral (e.g. Socio-Medical Unit For Access to Healthcare for children).

Figure 3

French Child Individual-Level Deprivation Index screening instrument (English translation) [Portable Document Format]

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Supp1.09.07.21.xlsx](#)
- [Supp209.07.21.xlsx](#)
- [Supp3.OutilENVUFr.pdf](#)
- [Supp4.Dataset.xlsx](#)