



Fig S1. Flow chart of the population for analyses

Table S1. The Health Status Classification System - Preschool: domains, number of levels and score interpretation

Domains	Level	Description
Original domains		
Vision	1	Sees normally without glasses – e.g. able to see well enough to recognize small objects and familiar people at a distance.
	2	Sees normally with glasses – e.g. able to see well enough to recognize small objects and familiar people at a distance.
	3	Sees objects close to oneself – e.g. at arm’s length, but has visual limitations at distance, even with glasses.
	4	Limited vision, both near and far, even with glasses.
	5	Unable to see at all.
Hearing	1	Hear what a person is saying in a usual environment with background noise and distractions without a hearing aid.
	2	Hear what a person is saying in a quiet environment when there are no competing distractions (with or without a hearing aid).
	3	Hear what a person is saying with limitations even with hearing aids.
	4	Unable to hear what a person is saying even with hearing aids.
	5	Unable to hear at all.
Speech	1	Speaks clearly and is understood by everyone.
	2	Parents understand most speech but others have some difficulty understanding the words.
	3	Speech is somewhat unclear, even to parents.
	4	Does not speak or makes only monosyllabic/unintelligible sounds (includes sounds understood by caregivers).
Mobility	1	Walks, bends, lifts, jumps and runs as well as others the same age.
	2	Walks, bends, lifts, jumps or runs with some limitations but does not require mechanical equipment or the help of another person to get around independently (e.g. a clumsy but independent walker).
	3	Walks or gets around without any help from another person, but requires mechanical equipment (this level includes independent crawlers).
	4	No independent mobility – requires the help of another person to get around and may also require mechanical equipment (e.g. stroller).
Self-care	1	Full use of both hands and ten fingers.
	2	Limitations in the use of hands or fingers, but does not require special tools or help of another person (includes: slow, awkward but independent).
	3	Limitations in the use of hands or fingers, requires the help of another person for some tasks (not independent even with use of special tools).
	4	Limitations in the use of hands or fingers, requires the help of another person for all tasks (not independent even with use of special tools).
Self-care	1	Eats, bathes, dresses and uses the toilet as well as others the same age.
	2	Requires a little more than usual assistance for age to eat, bathe, dress or use the toilet.
	3	Requires a lot more than usual assistance for age to eat, bathe, dress or use the toilet.
	4	Requires total care – unable to participate in self-care activities.

Emotion	1	Usually cheerful and interested in everyday activities, but may occasionally be irritable, fretful or unhappy.
	2	Often irritable, fretful, unhappy or uninterested in everyday activities.
	3	Almost always irritable, fretful or unhappy and usually uninterested in everyday activities.
Learning and remembering	1	Learns and remembers new information as well as others the same age.
	2	Learns and remembers new information a little more slowly than others the same age.
	3	Learns and remembers new information much more slowly than others the same age and may be receiving a special program for learning needs.
	4	Unable to learn and remember.
Thinking and problem solving	1	Able to think and understand how to solve everyday problems as well as others the same age.
	2	Has a little difficulty when trying to think and understand how to solve everyday problems.
	3	Has great difficulty when trying to think and understand how to solve everyday problems.
	4	Unable to think and understand how to solve everyday problems.
Pain and discomforts	1	None pain or discomfort (for example, generally has no earache, constipation, or toothache).
	2	Sometimes has pain but this hardly disrupts everyday activities.
	3	Has recurring pain which disrupts a lot of everyday activities.
	4	Always has pain which disrupts all everyday activities.
Two items additional to the original 10-domain HUI system		
General health	1	Generally in good health, routine use of health resources.
	2	Slightly more than usual illnesses and use of health resources.
	3	Frequent illnesses and use of health resources.
	4	Almost always ill, very frequent use of health resources and hospitalizations.
Behavior	1	Generally easy to get along with, well behaved, plays well with others even if slow to warm up (shy).
	2	Occasionally hard to get along with, disruptive, stubborn, decreased attention span, or occasionally withdrawn, apathetic, unresponsive to others.
	3	Frequently hard to get along with, disruptive, stubborn, poor attention span, or frequently withdrawn, apathetic, unresponsive to others.
	4	Requires medication and/or constant supervision by caregiver and/or special program.

Table S2. Characteristics of the study group (N=4546)⁺

Variable	n	%	Mean (SD)
Family characteristics			
Marital status (married/living together)	4006	92.4	
Maternal educational level			
High	1348	33.8	
Mid-high	1198	30.1	
Mid-low	1017	25.5	
Low	420	10.5	
Paternal educational level			
High	1227	39.6	
Mid-high	657	21.2	
Mid-low	763	24.6	
Low	454	14.6	
Maternal ethnic background			
Dutch	2970	65.8	
Other western	392	8.7	
Non-western	1149	25.5	
Paternal ethnic background			
Dutch	2462	73.5	
Other western	213	6.4	
Non-western	673	20.1	
Net household income (€ per month)			
<2200	1167	30.9	
≥2200	2604	69.1	
Child characteristics			
Gender (boys)	2257	49.6	
Age when questionnaire is filled out (months)			36.7 (1.5)
Birth weight (grams)			3440 (570)
≥2500	4307	94.8	
1500-2500	206	4.5	
<1500	28	0.6	
Gestational age at birth (weeks)			39.8 (1.8)
≥37	4256	94.0	
32-37	239	5.3	
<32	31	0.7	
Wheezing chest in the past one year			
No	3849	87.3	
1-3 times	454	10.3	
≥4 times	104	2.4	
Ear-Nose-Throat (ENT) surgical procedures ever			
No	3956	88.5	
Yes	513	11.5	
CBCL borderline/non-clinical total problem score based on Dutch norms			
No	4235	94.3	
Yes	255	5.7	

⁺ The number of missing varies across variables.

Table S3. Non-response analyses (n=7294)⁺

Characteristics	Population for analysis (n=4546)	Excluded population (n=2748)	P value ^a
Family characteristics			
Respondent (mother)	4196 (94.3)	416 (92.4)	0.005
Marital status mother at age 3 (married/living together)	4006 (92.4)	1815 (79.1)	<0.001
Maternal educational level ^b			
High	1348 (33.8)	74 (20.1)	<0.001
Mid-high	1198 (30.1)	79 (21.5)	
Mid-low	1017 (25.5)	124 (33.7)	
Low	420 (10.5)	91 (24.7)	
Paternal educational level ^b			
High	1227 (39.6)	317 (24.9)	<0.001
Mid-high	657 (21.2)	210 (16.5)	
Mid-low	763 (24.6)	372 (29.2)	
Low	454 (14.6)	374 (29.4)	
Maternal ethnic background ^c			
Dutch	2970 (65.8)	869 (35.3)	<0.001
Other western	392 (8.7)	200 (8.1)	
Non-western	1149 (25.5)	1395 (56.6)	
Paternal ethnic background ^c			
Dutch	2462 (73.5)	720 (48.9)	<0.001
Other western	213 (6.4)	91 (6.2)	
Non-western	673 (20.1)	661 (44.9)	
Net household income (€ per month)			
<2200	1167 (30.9)	1068 (60.7)	<0.001
≥2200	2604 (69.1)	691 (39.3)	
Child characteristics			
Gender (boys)	2257 (49.6)	1425 (51.9)	0.068
Age when questionnaire is filled out (months)	36.7(1.5)	36.8(1.6)	0.239
Birth weight (grams)	3440.0 (569.9)	3355.5(569.2)	<0.001
≥2500	4307 (94.8)	2566 (93.6)	0.039
1500-2500	206 (4.5)	161 (5.9)	
<1500	28 (0.6)	15 (0.5)	
Gestational age at birth (weeks)	39.8 (1.8)	39.7 (1.8)	0.016
≥37	4256 (94.0)	2532 (92.8)	0.024
32-37	239 (5.3)	183 (6.7)	
<32	31 (0.7)	13 (0.5)	
Wheezing chest in the past one year			
No	3849 (87.3)	368 (85.0)	0.364
1-3 times	454 (10.3)	52 (12.0)	
≥4 times	104 (2.4)	13 (3.0)	
Surgical procedures ever			
No	3956 (88.5)	396 (89.6)	0.499
Yes	513 (11.5)	46 (10.4)	
CBCL borderline/non-clinical total problem score based on Dutch norms			
No	4235 (94.3)	372 (84.9)	<0.001
Yes	255 (5.7)	66 (15.1)	

⁺Values are absolute numbers (percentages) for categorical variables or means (standard deviation) for continuous variables. Data was missing for respondent (n=2393), ethnic background of mothers (n=319), ethnic background of partners (n=2474), educational level of mother (2943), educational level of partner (2920), marital status (n=665), net household income (n=1764), age (2280), birth weight (11), gestational weeks (40), surgical procedures (n=2333), CBCL (n=2366), wheezing (n=2454).

^a Independent-sample t tests for continuous variables and Chi-square tests for categorical variables.

^b High education corresponds to university degree; mid-high level corresponds to higher vocational training, Bachelor's degree; mid-low level corresponds to more than 3 years general secondary school, intermediate vocational training; low level corresponds to no education, primary school, lower vocational training, intermediate general school, or 3 years or less general secondary school.

^c Ethnicity is defined according to the Dutch standard classification criteria (Statistics & Netherlands, 2004) and categorized as 'Dutch', 'Western' (other European, North-American and Oceanian) or 'non-Western' (Turkish, Moroccan, Indonesian, Cape Verdean, Surinamese and Antillean).

Table S4. Discriminative ability of the HSCS-PS between subgroups differing in the number of conditions (n=4302)[†]

HSCS-PS domains	Number of conditions						
	No condition (n=3050)	1 condition (n=940)		2 conditions (n=262)		≥3 conditions (n=50)	
	Mean (SD) ^a	Mean (SD) ^a	Effect size ^{b1}	Mean (SD) ^a	Effect size ^{b2}	Mean (SD) ^a	Effect size ^{b3}
Original domains							
Vision	1.01 (0.16)	1.02 (0.19)*	0.05	1.03 (0.23)	0.09	1.08 (0.44)*	0.16
Hearing	1.01 (0.11)	1.03 (0.18)**	0.11	1.05 (0.25) ***	0.16	1.10 (0.30) ***	0.30
Speech	1.32 (0.48)	1.39 (0.53)***	0.13	1.50 (0.65) ***	0.28	1.44 (0.61)	0.20
Mobility	1.01 (0.12)	1.02 (0.17)*	0.06	1.09 (0.35) ***	0.23	1.24 (0.69) ***	0.33
Dexterity	1.00 (0.06)	1.01 (0.10)	0.10	1.03 (0.20) ***	0.15	1.16 (0.55) ***	0.29
Self-care	1.09 (0.30)	1.16 (0.40)***	0.18	1.22 (0.53) ***	0.25	1.44 (0.91) ***	0.38
Emotion	1.00 (0.05)	1.01 (0.09)**	0.11	1.03 (0.18) ***	0.17	1.02 (0.14)*	0.14
Learning and remembering	1.00 (0.07)	1.03 (0.16)***	0.19	1.10 (0.37) ***	0.27	1.12 (0.39) ***	0.31
Thinking and problem solving	1.01 (0.12)	1.03 (0.19)*	0.11	1.09 (0.38) ***	0.21	1.18 (0.56) ***	0.30
Pain and discomfort	1.08 (0.28)	1.18 (0.39)***	0.26	1.19 (0.41) ***	0.27	1.40 (0.57) ***	0.56
Disability score ^c	10.55 (0.81)	10.86 (1.13) ***	0.27	11.33 (2.10) ***	0.37	12.18 (3.49) ***	0.47
Two items additional to the original 10-domains HUI system							
General health	1.01 (0.13)	1.09 (0.30) ***	0.27	1.17 (0.44) ***	0.36	1.54 (0.81) ***	0.65
Behavior	1.03 (0.17)	1.09 (0.32) ***	0.19	1.13 (0.36)***	0.28	1.22 (0.47) ***	0.40

[†]Data are presented as mean or standard deviation.

^aTwo-sided Mann-Whitney U-test given a non-normal distribution of the data.

^{b1} Difference of the means divided by the largest standard deviation between children with one condition and children with no condition.

^{b2} Difference of the means divided by the largest standard deviation between children with two conditions and children with no condition.

^{b3} Difference of the means divided by the largest standard deviation between children with three or more conditions and children with no condition.

Cohen's effect size (d): 0.2≤d<0.5 indicates a small difference, 0.5≤d<0.8 indicates a moderate difference, d≥0.8 indicates a large difference.

^cSum of the ten original domains.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

HSCS-PS: Health Status Classification System-Preschool

