The Early Human Capability Index (eHCI)

About the Early Human Capability Index (eHCI)

The eHCI has been developed for the disciplines of epidemiology, population health, economics, early education and global health and development. Such disciplines seek the following attributes in an instrument;

- high sensitivity and specificity,
- psychometrically reliable,
- high predictive validity,
- pragmatic and efficient,
- can be applied in low to middle income countries across large populations,
- designed to minimize social response bias and
- includes vignettes to maximise comparability across studies, cultures, contexts and countries

Traditionally measures of child health and child development have been born out of psychology and paediatrics. Such instruments tend to have a deficit focus, are developed from a western frame and are specific to a single developmental aspect. Additionally they tend to have strict licensing requirements, can be expensive and often lack transparency in how they are devised.

The eHCI is a holistic measure that is intended to capture early child development across diverse cultures and contexts. The instrument has been developed with a view to capture the key aspects of child development (cognitive, non-cognitive, health) of 3-5 year olds that predict future capability.

The eHCI can be used for: population monitoring and surveillance; impact evaluations of interventions aimed at improving child health, early education and development; and for longitudinal cohort studies looking to predict the future capabilities and capacities of children.

The instrument is a survey tool that can be completed by parents/caregivers, child care workers, teachers, allied health and other health or early childhood practitioners. The eHCI is not a developmental milestone test, but is a measure where a child can be placed on a developmental spectrum. As such the eHCI can determine if a child is thriving or doing poorly on different aspects of development, and can detect developmental change over time.

The instrument is available free of charge in the interests of public good.

The eHCI covers the following aspects of child development:
- General verbal communication,
- Approaches to learning,
- Numeracy and concepts,
- Formal literacy- reading,
- Formal literacy-writing,
- Cultural knowledge,
- Social and emotional skills,
- Perseverance, and
- Physical health.

What do we mean by early child development and human capability?

Early childhood development is the holistic development of children from conception. Development is defined as the process of change in which the child comes to master more and more complex levels of moving, thinking, feeling and interacting with people and objects in their environment. The various aspects of development tend to be called developmental domains. Children will develop at different rates on each of the developmental domains. For example, if you observe 1,000 babies and observe how old they are when they begin moving around, you will generally see children starting to crawl from 6 to 10 months of age. This age range is considered the normal developmental range for this ability. That is the entire period during which the ability can appear is considered on course for healthy development. The rates and patterns of development during the early years are highly variable, and not all children who are doing well are doing the same thing at the same time. Development is considered to be delayed when children have not reached these developmental milestones within the expected time period. For example, if the normal range for learning to walk is between 9 and 15 months, and a 20-month-old child has still not begun walking, this would be considered a developmental delay.

The dimension of "early human capability" allows for the measurement of both the positive and negative aspects of how a child is developing as well as allowing for a holistic approach to the child, as opposed to "developmental delay" or pathology. The measurement of early human capability has the potential to place a child on a developmental trajectory rather than simply a pass or fail outcome.

Studies investigating early human capability tend to talk about physical health and also the cognitive and non-cognitive aspects of human development[1, 2]. Physical health from a developmental point of view generally includes height and weight (for the calculation of stunting and wasting) and indicators of how sickly a child is. Cognitive development includes abstract problem solving skills, and early literacy and numeracy skills, while the so called non-cognitive aspects tend to include a child's social and emotional development such as self-regulation and temperament and can also include approaches to learning, such as perseverance and their interest in learning new things. The eHCI has been developed to cover all these aspects of development and does so for an age range spanning aged 3 years through to 5 years.

Another unique aspect of the eHCI is that it has been developed to try to reduce "social desirability response bias". This is where the person responding to the questionnaire tends to give overly positive responses that aren't always correct. For example a mother might tell you that their child can do something that they actually can't quite do yet. To reduce the tendency for this bias many of the response options in the eHCI are "can already" or "can't yet", rather than a "yes"/"no". In addition, within each section there is a gradation of items – i.e. they are graded from easy to hard within each section. The introduction to the eHCI is also important for respondents to understand – here it is explained that the questionnaire is used for children ranging from 3 through to 5 years of age and that development is varied, so we expect that children will be already showing some aspects of development but not others and that this is normal and OK.

Below is further detail for some of the questions within the eHCI.

General verbal communication

1   Can this child communicate their needs by crying or pointing?

2   Can this child understand local language?

For example: demonstrates understanding by responding appropriately to what is said i.e. doing the task they have been told to do.

3   Can this child use words to get their needs met?

For example: a child might say "more" to indicate that they want more food.

4   Can this child tell you about their day using a single word or simple sentence?

Simple words could be: park or painting.
Simple sentences could be: went to Grandma's house

5   Can this child tell you about their day using multiple sentences?

For example: I went to grandma's house and we cooked together

6   Can this child take turns speaking in a conversation?

For example, you ask the child: where did you go today? And the child respond's "to grandma's house", and you say :"what did you do there?" And the child responds "we cooked together". The child knows to wait for their turn within the conversation.

Approaches to learning

7   Does this child show more curiosity about something new in comparison to something familiar?
If a child is given a new toy, do they show more curiosity towards it than an old toy they have had for a while.

8   Does this child investigate/explore the function of a new toy/game/puzzle or object?

If the child is given a set of building blocks, do they explore how to make shapes

9   Does this child use objects in make-believe play?

For example: a child might pretend a broom is a horse, or under a table is a house, a stick is a microphone or a sword.

10   Is this child interested in games?

11 **When in an unfamiliar environment with a familiar person present, does this child feel free to explore?**

12 **Is this child diligent in their approach to a new job or task?**

The child is careful and hard working in their approach to a task.

Numeracy and concepts

13 **Can this child recognise geometric shapes (e.g. triangle, circle, square)?**

Child doesn't necessarily need to know the name of the objects, but they can demonstrate recognition of the shapes by matching or sorting.

14 **Can this child name and identify at least 3 colours?**

15 **Can this child sort and classify objects by two common characteristics (e.g. shape, colour, size)?**

For example if there was a box full of red and yellow squares and triangles, the child could sort the contents of the box into yellow triangles, yellow squares, red triangles and red squares.

16 **Can this child name and recognise the symbol of all numbers from 1 to 10?**

Can be prompted. For example you could ask "what number is this?", while pointing to the number 6, and the child should be able to answer 6.

17 **Can this child count to 20?**

Child shouldn't make mistakes most of the time. Child can't forget any numbers when counting.

18 **Does this child know that a giraffe is taller than a cat?**

Animals should be replaced to animals that would be familiar to children in the local area. This question is designed to measure the child's understanding of heights.

19 **Does this child know the order of the day (e.g. breakfast then lunch then dinner then sleep)?**

20 **Does this child understand the concepts of yesterday, today and tomorrow?**

21 **Does this child know that an elephant weighs more than a mouse?**

Animals should be replaced to animals that would be familiar to children in the local area. This

question is designed to measure the child's understanding of weights.

22 **Does this child know that the number 8 is bigger than the number 2?**

Formal literacy - reading

23 **Can this child follow reading directions? (i.e. left to right, top to bottom)**

Know how to turns book pages in the right way. Child might also demonstrate this by following the text on a page with their finger in the correct order while someone is reading to them.

24 **Can this child identify at least 3 letters of the alphabet?**

25 **Can this child identify at least 10 letters of the alphabet?**

26 **Can this child read at least 4 simple popular words?**

For example: mum, dad, cat, ball, book, boy, girl, truck

27 **Can this child read complex words?**

For example: happy, hungry, chicken, monkey

28 **Can this child read simple sentences?**

For example: The boy has a ball. The cat is hungry.

Formal literacy - writing

29 **Can this child scribble on a page using a pen/pencil/crayon?**

30 **Can this child draw something identifiable? (e.g. a stick person)**

31 **Can this child write at least 3 letters? (e.g. A, B, C)**

32 **Can this child write their own name?**

Letters should be identifiable and in the correct order.

33   Can this child write simple words?

Letters should be identifiable and in the correct order.

34   Can this child write simple sentences?

Words should be in the right order and the sentence should be sensible.

Cultural knowledge

35   Can this child identify two _local animals_?

Insert two common local animals. For example in Australia could be kangaroo and dog.

36   Can this child identify two _culturally important foods / dishes_?

Insert two locally important food/dishes. For example in Italy pizza and pasta.

37   Can this child identify two _local plants that provide food / fruits_?

Insert two local plants. For example in Indonesia coconut trees, mango trees.

38   Can this child sing a familiar children's song (e.g. _Twinkle, Twinkle_)?

Insert local song. Child should know most of the words as well as the tune.

39   Can this child perform prayers / cultural routines?

Social and emotional skills

40   Is this child happy to share their toys and belongings?

Without being asked the child will happily share their toys with friends and family.

41   Does this child take care of their own things?

Looks after their own things.

42   Does this child demonstrate respect for adults?

Demonstration of respect will vary by culture. For example the lowering of eyes when answering an adult is appropriate in some cultures but not others.

43   Does this child demonstrate respect for other children?

Child is attentive to other children and treats them the same way as they would expect to be treated.

44   Does this child accept responsibility for their actions?

For example a child would admit that they broke something and not blame another person.

45   Is this child considerate of other people's feelings?

Child is aware of how their actions influence others, for example they may offer support or comfort to a child who is sad.

46   Is this child helpful?

Will this child offer to help another child who is struggling in a game.

47   Is this child friendly to other children?

Gets along well with other children and is liked by other children.

48   Does this child kick, bite or hit adults or other children?

49   Is this child impatient?

Child has difficulty awaiting their turn in games or groups. Child doesn't let someone finish speaking before interrupting.

50   Does this child understand the difference between right and wrong?

Does this child have a sense of justice. Do they know that they should share their belongings and not take others belongings without asking first?

51   Does this child follow simple directions on how to do something?

Without having to be told more than once

Perseverance

52   Does this child perform tasks independently?

 The child will try to work out the task themselves.

53   Does this child keep at a task until they are finished?

 In most circumstances the child will keep at a task until they have finished it.

54   Does this child need constant reminding to finish something off?

55   Does this child get easily distracted from a task?

Does this child get involved in the task that they have been given or are they always distracted by other children or something else going on.

Physical health

56   Is this child frequently sickly?

Is this child often sick and in poor health.

57   Does this child always wash their hands after toileting?

Does this child show good hygiene

58   Does this child have any disabilities / special needs?

These should be severe disabilities or special needs, for example down syndrome, cerebral palsy, deafness, very poor sight/blind.

59   Child's height

Please note if the height is measured in mm/cm, or inches/feet.
Child should be standing upright against a wall without shoes on, height should be measured to the top of their head.

60   Child's weight

Please note if the weight is measured in grms/kgs or pound/stone.
When weighed the child should be wearing light clothing, without a coat or shoes, or holding a backpack etc.

References:

1.   Heckman J. Skill formation and the economics of investing in disadvantaged children. Science. 2006;312(5782):1900-2.
2.   Heckman J. Schools, Skills, and Synapses. Economic Inquiry. 2008;46(3):289-324.