Transitioning from infancy to adulthood: a black box full of opportunities

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A better understanding of the factors that modulate the transition of lung function from infancy to adulthood is key to understanding adult respiratory health https://bit.ly/3k1mXA0

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During pregnancy, an obstetrician takes care of both mother's and child's health. After birth, a paediatrician continues to care for the child and, if nothing serious and unexpected happens, most adolescents will be on their own without sanitary control until about their 5th–6th decade of age, where prevalent cardiovascular, respiratory and/or metabolic chronic diseases begin to emerge. This has been described as a "black box" period [1] which, interestingly, may be full of opportunities for prevention, early diagnosis, careful monitoring and, eventually, early intervention. Two recent observations support this possibility. First, between 4 and 12% of young adults (~25 years of age) in the general population have low lung function and, importantly, they are at a higher risk of respiratory, cardiovascular and metabolic diseases later in life, and die prematurely [2, 3]. Second, there are many different environmental risk factors that influence lung function through life and, as shown in figure 1, these factors change with age and interact between them in an increasingly complex fashion [4]. Eventually, it is this dynamic set of gene–environment interactions which modulates the lung function trajectory (figure 2) that any individual follows from birth until death [3, 5–8]. Collectively, these observations indicate that early life events are critically important in determining the health expectancy of the individual through life [7], and open new opportunities for disease understanding, disease prevention, early treatment, therapeutic optimisation and, eventually, prognosis improvement [9, 10]. For instance, if, as discussed above, not achieving a normal lung function peak in early adulthood identifies a group of young individuals at risk of respiratory, cardiovascular and/or metabolic diseases later in life, as well as of premature death [2], then spirometry should be routinely measured in this young population, perhaps when they apply for a driving licence, when they enter the army and/or begin university studies [7, 9]. Likewise, we now know that some children born with low lung function can "catch-up" and regain a normal lung function trajectory, whereas others cannot (figure 2) [7]. The precise mechanisms underlying this "catch-up" are currently unclear and possibly involve both environmental and genetic factors [7], but their better understanding may open possibilities for better prevention [11], as well as to stimulate lung growth in infancy and, perhaps, later in life too [7].