



# Estimating health effects of income inequality changes caused by life cycles: a study at the subnational level



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# Context of the study

- Here, “Social LCA” is a method allowing to anticipate the social consequences of changes in life cycles, by comparison.
- Several alternatives are available to compare social impacts of life cycles : e.g. ask experts, ask actors of the life cycle, scenario analysis, calculate relationships...
- Here, we deal with only one impact pathway

# This research

- ... will contribute to build the generic method of social impacts assessment . *It is similar to the approach developed in environmental LCA, by building pathways of “type 2”*. Consists of formalized relationships (based on the past) that allow anticipating social impacts under certain conditions to be checked.
- ... deals with the link between **changes in the life cycle**, and **changes in the health of population** through the **changes in the repartition of incomes** in the population.

# Short history of the research

- From Economic literature, there is a direct link between the variations of income inequality and health.
- In some cases, there is a link between changes in the life cycle and the variations of income inequality (e.g. through wages to workers).



A general relationship “The Wilkinson pathway” has previously been set to assess the above socioeconomic effects at country level (Bocoum et al., forthcoming)



But, the real stake of calculating the effects of changes in a life cycle on income inequality and health is mainly at a **smaller scale**

# What do we want to measure?

# How?

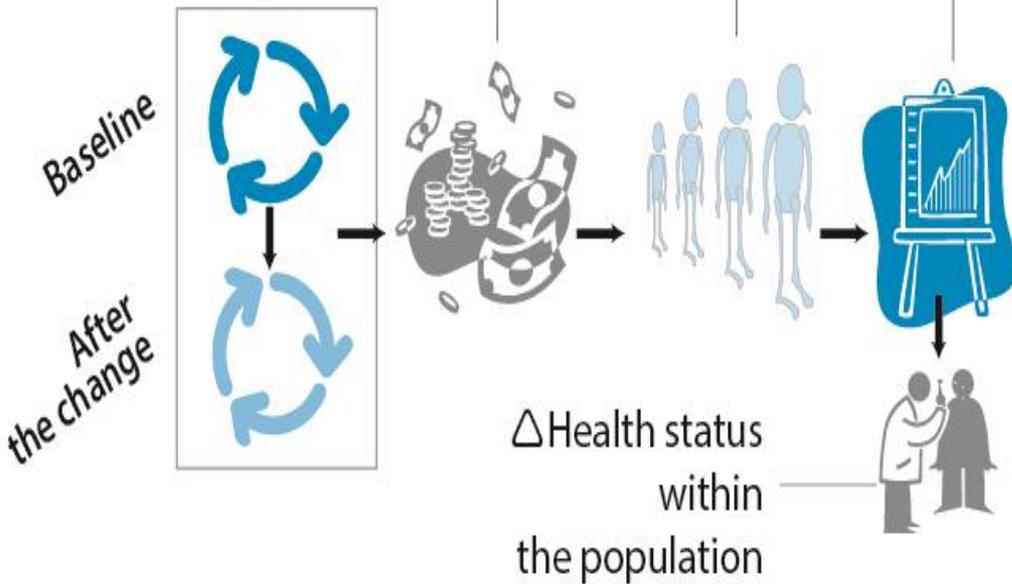
*Change in  
the life cycle  
of a product*

$\Delta$  Turnover  
of companies  
affected

$\Delta$  Number  
of jobs

$\Delta$  Distribution  
of income  
(Gini  
coefficient)

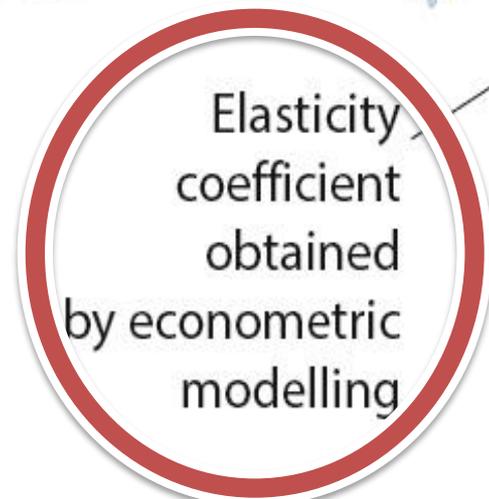
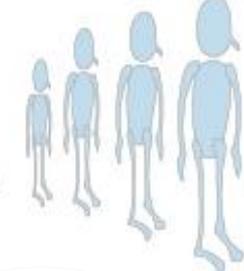
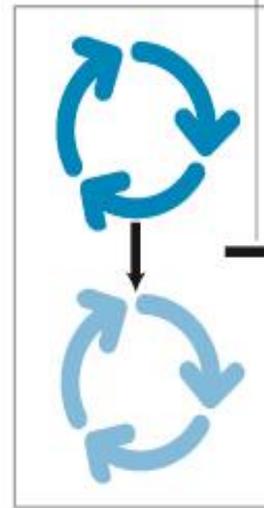
$\Delta$  Health status  
within  
the population



Technical coefficients from Input-Output tables

Brown formula (based on number jobs and total income per income class)

Average labor productivity per sector



Elasticity coefficient obtained by econometric modelling

# The core issue

- Assessing the relationship (1) between income inequality and health at subnational level.

	At national level	At sub-national level
How to assess inequalities ?	Gini	Gini
How to assess health ?	Infant mortality	Self-rated health

# What about Income inequality – Health relationship at subnational level ?

- Several studies showed a **negative correlation** between income inequality and individuals' self-rated health, except at neighborhood level
- Yet, causality has not been demonstrated, because of cross-sectional data. So, causality will be tested by replicating the recent work of Rostila et al. (2012) on the municipalities of Stockholm and using longitudinal data
- The effect of the following factors on the relationship will also be tested: size of the geographical areas, time lags, **spending on social goods**.
- The case study will draw on longitudinal data of Gini and health inquiries in Canada.

# How to use it in

## social life cycle impact assessment? (1/2)

- Assessing the flow of turnover created or destroyed by the change, in the different sub-sectors of the economy involved in the life-cycle.
- Deducing the number of jobs created or destroyed (using average labor productivity per sector)
- Calculating the new Gini:  $G_0 \longrightarrow G_1$
- Calculate the change in health, thanks to relationship (1).

# What tools? (2/2)

## **Essential tools:**

- Input-Output tables (IOT) to estimate the consequences of a production variation in the supply chain sectors
- Labor productivity to translate variations of production in variations of number of jobs created or destroyed in different income classes
- Gini coefficient

## **Alternative approaches when IOT not available:**

- Empirical identification and quantification of the effects within the production chains
- Or multipliers of demand (effects of households' expenditures), supply (effects of local production of companies) and public spending

# Conclusion

- The research - in the continuum of the study of Feschet et al. (2012) - has to be considered primarily as a step forward towards social life cycle assessment using the impact pathways method
- Our specific contribution is to build one more pathway among several other which will be required to fully develop the above mentioned method
- Contributions of LCA's researchers and practitioners are awaited in order to reach this objective in a close future
- The method is promising for governments and big companies. It will help them assessing some impacts of changes in their activities on the entire population of a region, and making decisions against these assessments

# Thank you for attention!



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