Categorie: Health/Environmental Impact Assessment

Title: Quality of life impacts related to the time to access drinking water in Malawi
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Background
Universal and equitable access to safe and affordable drinking water for all by 2030 is one target stipulated in the Sustainable Development Goals (SDGs). As of 2015, 92% of the population in Malawi did not have access to water on premises and needed to fetch it. Thus, the issue of water accessibility warrants further research, particularly since the time/energy expenditure needed can impact the affordability of water and thus the quality of life and health of the population. This is perhaps the inverse problem of wealthy developed nations where greater active travel is required for improved health.

Methodology
Malaria Indicator Survey (MIS) 2014 Household survey datasets from Health Surveys program was analysed in STATA MP 14 for the aim of this study (n=3405). Time to fetch water was applied as a proxy of the distance to estimate energy expenditure.

Results
Two models were created to show the quality of life impacts of the distance to access water. First, by using the indicator initially apply by JMP to monitor the MDG target (i.e. proportion of the population with access to an improved water source irrespective of the time), the proportion of the population with access would be 86%. However, by adding a 30 minutes round-trip distance as a key threshold to the proportion of the population using an improved water source the proportion of the population with access would decrease to 72% (statistically significant different, p < 0.001).

Next, the energy impacts of such trips are estimated. By generating scenarios with different characteristics (e.g. slope, type of soil, physical health, load weight) the expenditure associated to the trip was estimated. A 30-minute trip at walking speed of 4 km/h without stopping (i.e. two kilometer round trip) would require for a 54 kg woman, an energy expenditure ranging from 100 to 760 calories with a 20 L one-way load (20 L is a minimum healthy amount). Considering that the Minimum Dietary Energy Requirement is 1706 calories in Malawi, this shows that a 30-minutes trip could cost between 6 and 45% of the daily energy intake, which could have serious impacts on the individual’s quality of life.

Conclusion
In order to develop appropriate interventions to improve drinking water access and overall quality of life, the distance between the source and the point of use must be quantified to determine where thresholds and limits may exist.