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Citizen sensing initiatives have multiplied in recent years as a way to better understand and act upon urban air pollution at the individual level. However, assessing their effects on behaviors remains a challenge. In 2019, a multidisciplinary academic team conducted a research on a French initiative where volunteer citizens were equipped with fine particle micro-sensors, and mobilized mixed methods to assess its impacts on individual practices. A cross analysis of quantitative data from the micro-sensors (3001 measure sessions from 73 sensors) and qualitative data from the volunteers (70 interviews and 49 questionnaires) was performed to analyze the strategies of capture deployed by the volunteers and the impact of the initiative on individual behaviors. Each data set analysis established a relationship between the ways in which volunteers use the sensors and the evolutions of the initiative. Their cross analysis strengthened this relationship and enriched its understanding by identifying the mechanisms at play: volunteers' capture behaviors over time and space are determined by their initial drive to participate in the initiative, the support they receive to use the sensor, understand the data and relate it to personal concerns, and their sense of belonging to a community of clean air ambassadors. The confrontation of data sets also helped nuance the declarative statements of volunteers regarding behavior change and identify common patterns in the process of adoption (types of new behavior, triggers and maintenance over time). This research confirms that mixed methods are relevant to evaluate the effectiveness of citizen sensing initiatives since they can be used to both assess their effects on individual behaviors and try to explain those changes. The work also highlighted the current limitations of mixed methods implementation (methodological issues and getting people from different disciplines to work together) and protocols for future research were recommended.

Key messages:

- Mixed methods can both enhance the impacts of citizen sensing on individual behaviors, health literacy and collective empowerment, and allow researchers to better assess those impacts.
- Mixed methods require the fusion of conceptual and methodological frameworks from different disciplines in a transdisciplinary perspective, those needing new partnerships built on mutual trust.