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Activity and time spend patterns of residents in low-income settlements in the City of Johannesburg, South Africa

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Abstract

Background

Human health risk assessment is concern about estimating the population exposure (HHRA) for environmental pollutants or contaminants. Exposure assessment for population-level require time-activity pattern distributions in association to microenvironments where individuals reside and spend their time**.** Time-activity patterns in South Africa have not been adequately explored, which may lead to wrong dose estimation for health risk assessment. No in-depth and systematic analyses of time-activity patterns in low-income communities have been done to date in South African context.

Aim

The aim of this study was to describe variations on time-activity patterns based on age, sex and socioeconomic status amongst residents of low-income communities in South African township (Matholesville informal settlement).

Methodology

A cross-sectional study design was adopted to assess time-activity patterns amongst low-income residents in South African townships. One Hundred and Thirty (130) households were selected randomly to participate in the study. A questionnaire survey comprising of key questions including demographics, type of household, type of activities conducting indoor, time spent on activities indoor and outdoor in a microenvironment, preferred season of the year and mode of transport commuting to different areas was administered to the study participants. In addition, diaries were used to get information on daily activity time pattern for seven (7) days.. Completion of questionnaire were based on interviews with the study participants while diaries were self-administered by the participants daily over seven days.

Results

In this study, a total of 130 participants aged 18-35 and 36-75 years were included. Approximately 33% and 67% of the respondents were < 35 years and >35 years, respectively. This suggests that most of the households are headed by adults outside the youth age category. About 30 houses were found to be erected using bricks while 100 houses were made of corrugated iron.

About 75%, 14%, 8% and 2% of the study respondents were found to fall into the following race, black, coloured, Indian and white. Approximately (83% brick, 71% shacks) of the study respondents attained secondary education the remainder of the respondents attained primary education. The most performed activities inside brick type dwellings are sleeping (100%), cooking (77%), cleaning (70%) and watching television (TV) (60%). While most performed activities indoors for shack dwellings are cleaning (87%), cooking (70%), sleeping (68%) and TV (37%). There is a high prevalence of none employed household heads at 53% for the brick dwelling and 63% for the shack dwellers. The average monthly income was found to be R4 304 and R3 650, for brick and shack type dwellings, respectively. Females were found to perform a larger proportion of indoor household activities than males. A total of 36% was spend on cooking and cleaning followed by 29% of the time watching TV in the brick type dwellings. For the brick dwellers spend 67% indoors and 33% outdoor while for the shack dwellers about 31% of the time is spend indoor.

Conclusion

The study had hypothesised that females above 18 years old residing in low-income communities are likely to spend most of their time at home carrying out domestic duties compared to their male counterparts, who are expected to spend most of the time outside the residential spaces. Therefore, the hypothesis for this study is partially confirmed, meaning that women spend most of their time indoor performing household chores than males. It was also found that the time spent indoor is relatively lower than what is globally reported as known to be >80% of the time, people are said to be indoors. This implies that the variation on the socio-economic status and sub-population including country's dynamic might be the biggest influencer of time-activity pattern. Data obtained from this study can be used to account variability in human health risk assessments and reduce uncertainty in the derived exposure dosage where time spent pattern is considered an important variable.

Recommendations

- ✓ Future studies may be carried out covering a larger population density to gain more detailed time activity patterns.
- ✓ This study focused on a low-income settlement which has different characteristics to semi-formal, rural, high tax yield settlements in South Africa. Therefore, a larger study focusing on different socio-economic classes need to be carried out to have a comprehensive time activity pattern dataset for South African population.

- ✓ The current project focused only on adult age group without considering vulnerable groups (toddlers, and elderly person) time activity pattern. An additional study focusing on children time activity pattern is required in order to gain an understanding on what activities children spend most time.