

# Use of community assets and the role of contextual factors on the participation of people with disability: results of participatory mapping in Envigado, Colombia

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## Research article

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## Abstract

Background Disability is an evolving concept that results from the complex interaction between a person with an impairment and the context in which he/she lives. There is limited understanding on the types, access and use of community assets valuable for people with disabilities, and the role of contextual factors. Our goal with this work was to identify access and use of community assets, and the role of contextual factors among people with disabilities, and the perspectives of rehabilitation professionals, residents of a suburban area in Colombia. Methods Using participatory mapping, a community based participatory approach, we carried out an assessment of community assets identified by people with disabilities and rehabilitation professionals. In-depth interviews informed the design of two asset mapping activities, one among people with disabilities (n=5) and a second with rehabilitation professionals (n=4). Results Main findings indicate a chain of contextual factors that limit access and use of assets stemming from the personal (e.g. financial resources, inaccessible housing), interpersonal level (e.g. lack of a personal assistance or aid), and community levels (e.g. lack of accessible public transportation and inaccessible buildings). In most cases these barriers are heightened by system level barriers (e.g. lack of effective enforcement of the legal framework). Conclusions Identifying these contextual factors, and their interactions, call for stronger enforcement of the existing legal framework through articulated work between different stakeholders so persons with disabilities can enjoy community assets.

## Introduction

People with disabilities (PWDs) represent 1 in 7 adults, or 15% of the world's population (1) . Since the enactment of the United Nations Convention of the Rights of Persons with Disabilities (CRPD) in 2006, disability has become a global human rights and development priority (1) (2) (3) . Despite this, many PWDs still face significant attitudinal, physical, communication, and information barriers that hinder their full participation in their communities as well as the exercise of their human rights (1) . Participation is understood as "an involvement in a life situation" (4) . Over the last two decades, Colombia has made significant rights-based policy advances to improve participation and reduce inequalities among individuals with disability, including the ratification of the CRPD (5) . Since the passage of the first law to promote the rights of PWDs in 1997, progress has been made regarding accessibility of the public built environment and transportation, mandatory inclusive education, and affirmative action policies to provide equal opportunities for employment (6–8) (9) . Despite these advances, in 2016 the report to the United Nations CPRD acknowledged that Colombians with disability face significant discrimination, low access to education and low employment rates, with larger inequalities experienced by those living in non-urban areas (10,11) . There is a gap between the implementation of disability inclusion policies, access to community assets, and improvements on participation among PWDs (2) .

Community assets are defined as anything that can be used to improve the quality of life in the community including places, services, businesses, and people (12) . Through access and use of community assets, participation of PWDs is increased. Community assets along with individual characteristics and behaviors, culture, and social context modify the disability experience (4) . Contextual factors often intersect and have cumulative influences on the ability of people with disabilities to fully participate and use community assets (13) . For instance, previous work among PWDs in New Zealand, explored factors limiting accessibility to sports and recreational assets (14) . The interaction between factors at the personal, interpersonal, community, and policy level such as motivation, accompanying individuals, negative attitudes from service providers, and governmental funding was key in limiting access (14) . In the United States, barriers within the built and natural environment, finances, assistive technology, transportation, information and technology access, social support and attitudes, systems and policies, affect participation at the individual, community, and societal levels (13) .

Given that the disability experience is multifactorial, the interaction of functional impairments with disabling social and contextual factors result in limited access and use of community assets (4) . Despite the implementation of policies to improve inclusion and participation of PWDs, within Latin America there is limited evidence on how community assets are accessed and used, and the role of rehabilitation providers and contextual factors especially outside urban areas. Rehabilitation professionals are key for promoting the full participation of PWDs as they coordinate care, facilitate access to resources, enable use of community assets, and provide further understanding of contextual facilitators and barriers (15) (16) . Using a socioecological framework and a community based participatory approach, our goals with this work were to: 1) identify community assets and the role of contextual factors, within a sub-urban community of PWDs as well as the perspectives of rehabilitation professionals in Colombia, 2) understand the strategies used by PWDs to access and use assets, and 3) identify actionable gaps that can inform public health interventions. The socioecological framework has been used to explore the interactions of factors at the personal, interpersonal, organizational/community, and socio-political levels, and to characterize outcomes related to inclusion of PWDs (14) (17) (18) . Through this framework the dynamic and interdependent interactions of individuals, their immediate settings, and the formal and informal larger social and physical contexts (assets) can be explored (19) (20) (21) .

## Methods

### Setting

This work was developed in partnership with the community organization Alfime during 2017. Alfime offers educational programs to PWDs and their families, as well rehabilitation health services (physical therapy, physical activity, psychology, legal advice, and independent living programs). Most of the programs are subsidized through public funds from the city of Envigado, located in the metropolitan area of Medellin, Colombia. Medellin is the second largest city in the country. The northern border of Envigado is Medellin which city center is 10 km away from Envigado center. On average, Alfime provides services to 250 PWDs every year; the city disability registry reported 1975 PWDs in Envigado in 2015 (22). Alfime is one of the main resources available for PWDs in Envigado. Nonetheless, while not the majority, Alfime also provides services to PWD from surrounding cities. The Institutional Review Board of the CES University reviewed and approved this study. Informed consent was obtained from all participants in the study.

### Sample and Recruitment

Participants in our study included PWDs and rehabilitation professionals. PWDs were defined as having a permanent physical or mobility impairment affecting their body, upper or lower limbs, dexterity or coordination (23). People with physical impairments were included as they represent the largest proportion of PWDs in the country (23). A purposive sample of PWDs, affiliated with Alfime, and with diverse physical impairments was identified, to reflect a diverse range of experiences. PWDs were eligible to participate if they were ages 18-44 and lived in Envigado. Rehabilitation professionals included those within and outside ALFIME, and were eligible if they provided care for PWDs or were involved in programs relevant to the population of interest. Rehabilitation professionals invited to participate represented various disciplines and perspectives, such as coordination of programs, independent mobility peer training, and family support.

### Procedures

For this study, we used Participatory Mapping. Participatory Mapping is a community-based participatory research method that aims to explore in detail the knowledge of community members of their spatial and social composition the availability of services, and the use and access to places and people by certain groups of the community (24). Participatory maps allow identification of assets, and potential facilitators and barriers for their use and access (24). Alongside mapping of assets, a qualitative approach was used to explore the experiences related to access and use of community assets, and their impact on participation of PWDs and rehabilitation professionals in Envigado, Antioquia (25). Through our previous qualitative work with key stakeholders in the community of Envigado, we identified the central question for the Participatory Mapping activity (25). That was, to identify access and use of community assets and the role of contextual factors. Community assets were defined as places they deemed valuable for their lives and that they regularly visited.

PWDs and rehabilitation professionals were invited to participate in two sessions. During the first session the instructions for the mapping activity were given. Instructions included showing participants how to record the entries in an activity sheet, where they were asked to record all locations they went to during the week following the session, including name of places visited, addresses, routes and transportation means used to get there, assistance required, and a description of accessibility at the final destination.

A week later, a second group session was conducted where each participant shared their entries. Using a large scale map of the city of Envigado, participants were asked to place the assets on the map. During the discussion participants elaborated on their daily life during the week, and reflected on past experiences that may had not been recorded but that were of value. The discussions were held separately for PWDs and rehabilitation professionals. Discussions were digitally recorded with participant's permission. The group sessions were facilitated in Spanish by two of the research team members [MLTH and MAM]. These discussions took place at a private room in Alfime. They lasted 90 minutes for rehabilitation professionals and 100 minutes for PWDs. Field notes were completed during and following each group discussion. Group sessions were transcribed verbatim and data was managed and analyzed using Dedoose Version 8.0.35, web application (2018).

### Data analysis

We used thematic content analysis to analyse the data. Techniques used in the analysis included analytical summaries, open coding, identification of thematic codes, and codebook development. Each group discussion was coded by two members of the team; disagreements were discussed and resolved through involvement of a third team member. Through thematic content analysis we

identified community assets, major challenges regarding access, and use of assets. Using the socioecological framework we identified barriers and their interactions, within the personal, interpersonal, community and system level that limit access and use of community assets. The results of this study were disseminated, in collaboration with PWDs who participated in the study, to a group of stakeholders in Envigado through a community forum.

## Results

A total of nine participants completed all steps of the study, five in the PWDs groups and four in the rehabilitation professionals group. Overall, all but one participant lived in Envigado, 7 were women, 6 had a physical impairment, and 5 were wheelchair users. Figure 1 shows the results of the asset mapping exercise.

Figure 1. Community assets that participants visited or identified in the City of Envigado over one week. Left - assets identified by PWDs; Right - assets identified by rehabilitation professionals.

## Identification of community assets and the role of contextual factors

Both PWDs and rehabilitation professionals indicated that the mapping exercise made them realize that they visited several places in their day-to-day life and acknowledged the vast amount of physical barriers to access an asset in their community. Assets identified in the community included places related to health (providers facilities), sports and recreation (theaters, shopping malls, stadiums, gyms, bars and restaurants, public parks), public services (city hall, notary services, banks), private buildings (one's home and family/friends home), religious worship places, education, and grocery stores. Only rehabilitation providers mentioned banks and notaries and one PWD mentioned the airport. Most of the assets were in Envigado (suburban) except specialized health care services that were in Medellin (urban).

Overall, participants in both groups identified a series of contextual factors at the personal, interpersonal, community, and system levels that limited access and use of assets in the community (Figure 2). Only rehabilitation professionals mentioned that the lack of individual disability awareness and self-acceptance hinders the enjoyment and use of community assets. This personal factor was not mentioned by the group of PWDs.

Figure 2. Facilitators and barriers to access and use community assets at the personal, and inter-personal, community, and system level as per the socio-ecological framework proposed by Bronfenbrenner (19).

PWDs and rehabilitation providers acknowledged that there are accessibility efforts at the community level; however, people's attitudes and behaviors hinder the use of assets by PWD. For instance, there may be accessible public spaces, but the inappropriate use of the space by others in the community makes them inaccessible. An example is when vehicles are parked blocking sidewalks curb cuts. Testimonies in both groups depict community accessibility measures that fail to facilitate the enjoyment of assets:

*"Now that we are talking about San Rafael hospital, there is a ramp but it is too steep, making it very difficult to go up" [Male, PWD].*

*"To enter the theater there are a lot of stairs, there is a stair lift but it only fits one person...if you go with a group of people that needs the lift...how long do you have to wait?...it also needs to be operated by someone from the theater, resulting in prolonged waiting times to access" [Female, rehabilitation professional]*

Interactions between the factors exacerbate the barrier(s) experienced at any given level, resulting in exclusion. In situations when people apparently have access to assets in their communities, the existing barriers result in not using them at all. For example, one of the rehabilitation professionals that also lives with a disability quit school because classes were at night and it was dangerous for him going back home on his wheelchair on the road: *"Last semester was very hard, it was at night (classes) and that is why I quit school...going back home rolling...more than one (car) will honk on me...and raining" [Male, Rehabilitation professional]*. In some cases, PWDs simply do not leave their homes as sorting out the barriers is too complex. This is reflected in the experiences of participants in both groups:

*"I'm a soccer fan, here is difficult to enter the stadium. They let me in; but, I have to be at the lawn by myself....So I stopped going and now I watch the games by myself at home. All my family goes to the stadium and I have to stay behind at home" [Female, PWD]*

*"I stopped going to a micro-enterprise course because the person that goes with me can't always go...if she can't go with me, I have to pay for transport...expenses are higher than income...people believe that it is just a matter of enrolling in an activity...but you have to do more*

things than that..." [Female, PWD]

## Strategies to access and use community assets

Enjoying and using assets in their communities (i.e. participating) is determined by the ability to simultaneously manage factors at different levels. Strategies to overcome situations that result from the interaction of factors at different levels from both groups were abundant. We provide and discuss examples for each levels, as follows.

- Personal-Interpersonal, the lack of an accessible home and an appropriate wheelchair increased the need for assistance and financial resources as it requires extra costs (e.g. paying someone for assistance to leave the home or to get to the asset of interest).

*"I prefer the church that is closer to my home...when it is not raining and my two sons are at home...I'm happy that they take my power wheelchair and I can go by myself to church...My daughter can't take it down, it is too heavy..." [Female, PWD]*

A similar case was described by a professional who did a home visit that week:

*"...That person's home has the worse accessibility, a 5th floor, no elevator and no ramp...two relatives have to leave work early once a week to carry him up and down the stairs in his wheelchair so he goes out" [Female, Rehabilitation professional].*

Personal-Community: Lack of accessible and reliable public transportation may increase the need for financial resources (e.g. to pay a taxi), to have extra time (e.g. not knowing when the accessible bus comes through the bus stop) or having to roll long distances to get to the asset of interest.

*"There are some public buses with accessibility [a lift for wheelchairs], not all of the buses have and we do not know with what frequency they run. This forces me to pay for taxi, I can't be late for an appointment and I can't go rolling" [Female, Rehabilitation professional]*

Lack of physical accessibility in routes to get to an asset requires advanced wheelchair mobility skills to navigate obstacles. When reflecting on the effect that lack of physical accessibility has on the participation of wheelchair users, only rehabilitation professionals mentioned that to be able to access assets, wheelchair users must learn advanced wheelchair mobility skills. As described by a male rehabilitation professional:

*"I usually roll [the manual wheelchair] on the street...accessible sidewalks...very few...even the new ones that we evaluated the other day are too high and do not have a curb cut". [Male, Rehabilitation professional]*

In this specific case the participant is able to overcome the physical obstacles because he has advanced wheelchair mobility skills. In the discussion about community assets related to leisure and culture one provider stressed:

*"We have the house-museum...to get there...people definitely need to learn how to maneuver their wheelchairs [the entrance is through a gravel parking lot]" [Female, Rehabilitation professional]*

- Personal-Community-System: Lack of accessible facilities, including restrooms, require the person to plan or overcome extra logistics (e.g. identifying an accessible restroom that may be at a different floor and taking longer routes to avoid obstacles). Lack of accessible and continuous pathways to go from one place to another may result in the person having to take more risks (e.g. roll the wheelchair on the street with the cars and motorcycles, having to be lifted by others up/down curbs or stairs).

*"The Nueva EPS [health center] has a mini ramp, but the doctors' offices are in the second floor. That is why they have to see you downstairs..." [Female, Rehabilitation professional]*

*"I think it is better that the parking spots for PWD are marked with a cone...even if you have a difficulty to get off the car to move the cone...you can scream, ask someone the favor..., if the cone is not there, people will use it...really, the problem is the citizen's culture...including thinking that the PWD is only the wheelchair user"..." [Female, PWD]*

## Actionable gaps to inform public health interventions for the community

Participants in both groups acknowledged that there is progress, some public spaces in Envigado have been undergoing accessibility interventions. In both groups there was discussion trying to explain the underlying reasons for the contextual barriers and ideas to tackle

the root problems. Lack of disability and accessibility awareness was mentioned by both groups. In the words of one participant:

*"...the problem is culture and the fact that people that are in charge, our governors and city mayors...that they know about planning so when a new building is going to be designed...you know, when people visit other countries they come back saying that there a lot of people in wheelchairs...and it is not that...the thing there is that people with disabilities live a normal life, they are not stuck at home and they have accessibility for everything...here we see a person with a disability and we have to tie them to a rope like Tarzan..." [Female, PWD].*

Educating others on disability awareness and accessibility was mentioned by most participants as an urgent strategy needed. In fact, the rehabilitation professionals had done an experiential exercise with public officials from the municipality and shared:

*"We did an awareness exercise with officers from public infrastructure development...we crossed a light - we had them use wheelchairs - one of them was in the middle of the crossing when the light changed to red..cars honked...this person later called the people in charge to inquire why the duration of the green pedestrian light was so short" [Male rehabilitation professional].*

Only one mentioned a specific case to use legal appeal (*tutela* mechanism in Colombia) to drive change: *"Some fellow students are going to help me to legally appeal so the university's accessibility is fixed" [Male, Rehabilitation professional].*

## Community forum

The above mentioned results were jointly presented by researchers and study participants to a group of stakeholders in Envigado, including study participants. Figure 3 illustrates an example presented during the community forum to depict the different levels of barriers that a person with a mobility impairment may encounter when trying to reach to a community asset. Stakeholders at the community forum brainstormed on actionable aspects to improve the enjoyment of community assets under equal conditions.

Figure 3. For people with mobility impairments in Envigado enjoyment of community assets is hindered because they cannot fully exercise their right to personal mobility.

## Discussion

A group of people with disabilities and rehabilitation professionals in Envigado, Colombia identified a range of community assets that are not always enjoyable under equal conditions due to barriers at the personal, interpersonal, community, and system level. Some of the most limiting barriers include those at the personal and home level with PWDs typically depending on caregivers, family or neighbors to accomplish tasks that could be considered routinary such as leaving the home or independently going to a community asset. Factors at the community and system level included lack of enforcement of current accessibility legislation that results in community assets that are inaccessible. Common strategies include depending on others for mobility or trying to accomplish tasks mostly on their own, with a significant toll on everyday's life. This illustrates important gaps such as lack of appropriate mobility devices and training on how to use them, lack of accessible housing, and lack of accessible transportation, built itineraries, and community assets. By identifying of multiple and inter-related barriers and facilitators from the perspectives of PWDs and rehabilitation professionals, we can propose actions to overcome pressing barriers such as leaving home daily to enjoy community assets. This may be implemented by Alfime, for instance creating a community to support those that need assistance to leave their home or to navigate the environment to go to a community asset. By informing the local authorities on the findings and promoting the collaboration among stakeholders it may be possible to advocate, monitor, and evaluate the proper implementation of the legal framework. Last, to raise awareness and foster education on inclusion, disability, and accessibility aimed at those who manage, coordinate, and lead assets so these topics can be mainstreamed and always be taken into account.

Our results at the personal level, align with a recent study in the US that demonstrated that home accessibility modifications positively impact the life of lower-income older adults with functional disabilities by allowing them to continue to live independently at home (26) (27). Access to appropriate assistive technology and associated services (e.g. training on how to use the device) have been acknowledged as requirements to the realization of all human rights and to meet the Sustainable Development Goals (SDGs) (28,29). Training in the assistive technology use is needed to be able to use it effectively in one's own context and reduce barriers (30). The CRPD states in that part of the right to personal mobility (article 20) the person must receive training in the use of an assistive technology device (3). In addition, and specific to wheelchairs, the World Health Organization Guidelines on Appropriate Wheelchair Provision clearly

recommends that users - and family members when applicable - receive appropriate training on how to use the device and navigate the environment (31).

At the community level, the accessibility in different settings (e.g. street and sidewalks pathways, public transportation, public and private buildings and facilities) is a major factor that contributes to exclusion by hindering the ability of people to use community assets. As reported previously, not only there is a general lack of accessibility; but, when actions are implemented towards progress, they are frequently done incorrectly (i.e. very steep ramps, inappropriate use of accessible parking spots) (32). Our evidence supports findings from previous research in Colombia reporting high levels of PWDs who are excluded and deprived from education and health rights (33). There are also reports of PWDs in urban settings in Colombia, spending more financial resources on taxis than their peers without disabilities due to the lack of accessible buses (34). According to the national disability registry, 46% of PWDs encounter barriers on the street that hinder their personal mobility and daily activities (23). More broadly, our results also align with evidence from other contexts in Latin America where students identified that the infrastructure to get to and at the university and attitudes of professors and administrative staff pose difficulties to full enjoyment of the university and their exercise of the right to education (35) (36) (37) (32). In high income settings, such as the US and Denmark, barriers at the community level prevail where PWDs report difficulties in using health care facilities and green spaces, respectively (38) (39). In Austria, barriers that hinder wheelchair users from using community assets were ground conditions, curbs stones, and gradients (40). In Sweden, in addition to the previous barriers, difficulties in services/assistance and attitudes/support also negatively impacted participation (30).

Our findings illustrate how the intersection of personal and interpersonal, community, and system factors impacts the participation of people with physical impairment. Challenges to use community assets due to barriers contribute to the risk of social isolation and exclusion of PWDs (41). Our results, as the ones by Hammel et. al, have implications for assessing contextual facilitators and barriers that affect participation to call for system changes to target, prioritize, coordinate, implement, and enforce actions at the municipal level in Envigado (13). As exclusion is multidimensional, there is a need to have tailored, coordinated actions that address the different levels of barriers and aim at ameliorating the potential negative outcomes of their interaction (33). It is important for service providers, funders, and policymakers to understand that contextual changes at the community level, supported by system's changes and personalized individual intervention can positively influence participation outcomes (13).

At the systems-level, neither PWDs nor rehabilitation providers mention specifically current legislations and lack of enforcement. The legal framework in Colombia is progressive and clearly mandates accessibility as a human right, starting from the constitution in 1991 until the Disability Law that was enacted after the ratification of the CRPD and the following National Disability Public Policy Plan (42). Article 9 of CRPD mandates State Parties to: "take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas" (3). The experiences captured in this study demonstrate that the implementation of this legal framework is still at its infancy. This is also evident in critical review of the first Colombian report to the UN clearly highlights that the UN urges the State to guarantee universal accessibility to all and also to pay more attention to the needs at the territorial level (43). Tangible actions to accelerate the implementation and enforcement of accessibility are urgently needed (2) (41). Even though there are regulatory mandates in place, lack of enforcement results in no sanction and lack of pressure to comply (44). PWD are the experts called to lead the implementation, monitoring, and evaluation of the legislation (45).

Capacity building among different stakeholders to understand disability issues and inclusive development is urgently needed (2). Our findings support that society's disability awareness is very low. Social and attitudinal barriers result in other barriers (1,3). PWDs and their organizations must have a protagonist role in the advocacy needed with a sense of urgency and in a coordinated manner with other sectors and stakeholders (41) (45,46). There is evidence in Colombia that citizen's coordinated and persistent advocacy actions foster change. Specifically, a situational analysis of the intersection between public transportation infrastructure, civil society organizations, and the rulings of the Colombian constitutional court in Bogota demonstrated how persistent actions at the individual level, using a system's level tool, can result in a positive change in accessibility (47). One example to improve accessibility of new developments in the built-environment in accordance with the current legislation, consists of consultation with PWDs and their organizations for planning and design, and as part of the consultation, practical simulation or usability evaluation may be conducted with a full range of potential users (48). As discussed in South Africa: "Moving stakeholders from policy into practice requires thinking about clear implementation pathways that cultivate a culture and builds a system that allows rights of real individuals to be realized on the ground" (46). Awareness raising is imperative as negative attitudes have been proven to be a barrier to achieving change (accessibility) (44). Disability officers at universities in South Africa justified not modifying buildings because of historical heritage value and cost of modifications (44). A previously proposed strategy to raise awareness is exposing architecture students to experiential exercise to understand the importance of

accessibility and universal design was found positive (49). This type of educational activities should be promoted more since architects are key to advocates for inclusive design and to build an environment that is accessible to all members of society (49). Importantly, this type of strategies must be implemented with caution. Research has shown that only putting yourself on others foot might have an opposite effect than intended - it is recommended that more inclusive curricula incorporates contemporary representations of disability, insider expertise, and awareness of strategies for challenging discrimination and promoting disability justice (50). To be able to have disability-related training in universities - and appropriate access to education for students with disabilities - university professors need to be better trained on universal learning design (32) (35) (36). The government must have a leading role taking the measures as mandated by Article 8 in the CRPD on awareness-raising: "To combat stereotypes, prejudices and harmful practices relating to persons with disabilities, including those based on sex and age, in all areas of life" (3).

As advances in the legal framework in Colombia have been substantial, efforts should be tailored at higher engagement of the community to advocate for stronger political-will to commit financial mechanisms to implement, deliver, and enforce inclusive community assets (2). In addition to financial support, inter-sectoral collaboration and articulation between disability experts and a system-wide approach to achieve inclusive results and not only isolated programs that tackle one type of barrier (2). Recent evidence demonstrates that this is possible: the government of Tajikistan in less 10 years with political will, technical assistance, finance and inter-sectoral effort was able to establish a national rehabilitation system according to the SDGs (51).

### *Study limitations and ongoing work*

Results of this study should not be used alone to inform policies and programs since it does not represent the views of different types of impairments and experiences of disability. Taking into consideration only one impairment type yields to interventions that do not impact positively all the community (52). Additional barriers are faced by other type of impairments, for instance how people with hearing impairments have difficulties accessing the web (53), watching television (54), or going to the movies (55). On the other hand, people with visual impairments may face additional barriers accessing digital education resources (56) and people with cognitive or intellectual impairments may face barriers understanding written information (57). The focus of this community asset participatory mapping was resources in the built environment; therefore, there was no focus on access to information on the digital arena (i.e. digital accessibility). There is also evidence of a growing digital divide between those with and without disabilities and with the aging population (58). On the other hand, this study only explored experiences in adults, the perspectives of younger and older individuals with disabilities is needed to be able to tackle and overcome barriers in a fully inclusive and universally accessible way (26). This is the experience of a sub-urban setting in Colombia, which may be similar in others. Rural context is different and future engagement with the rural community is granted.

Results from this project were disseminated to the larger community through a forum where the main findings were presented and discussed with public officials, academics, people with disabilities and advocacy organizations. As a consequence of engaging the community in this project, a community research group was created including community leaders, undergraduate students, and the co-authors of this work to further collect evidence on the current state of the accessibility to public transportation in the municipality. This resulted in a meeting of community leaders with decision-makers within the Metro system and the municipal Secretary of Transportation to discuss barriers evidenced through this work and promote urgent actions to address them.

## **Conclusions**

People with disability in Envigado, Colombia face significant barriers mainly related to the right to personal mobility and accessibility to fully enjoy community assets. Engagement of PWDs in research along side with relevant stakeholders provides an opportunity to identify gaps in the implementation of actions as well as strategies that are relevant for the community. Identification of the interactions between barriers that limit access to community assets, allows PWD, organizations, academia, and the local authorities to propose coordinated evidence-informed actions to advance the full participation of PWDs.

## **List Of Abbreviations**

CRPD - Convention on the Rights of Persons with Disabilities

PWDs - people with disabilities

SDGs - Sustainable Development Goals

## Declarations

### Ethics approval and consent to participate

This project was approved by Universidad CES Ethics Committee session 94 in 2016. The written consent form was sealed and approved for use by the committee on February 2, 2017.

### Consent for publication

Not applicable

### Availability of data and material

The datasets generated and analysed during the current study are available from the corresponding author on a reasonable request.

### Competing interests

The authors declare that they have no competing interests.

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### Authors' contributions

MLTH conceived and designed the project, collected the data, analyzed and interpreted data, and was a major contributor in writing the manuscript. MAMB collected the data, analyzed and interpreted data, and critically revised the manuscript. LVT conceived and designed the project, analyzed and interpreted data, and critically revised the manuscript. WCC conceived and designed the project, provided methodological support, interpreted data, and was a major contributor in writing the manuscript. All authors read and approved the final manuscript.

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## Figures

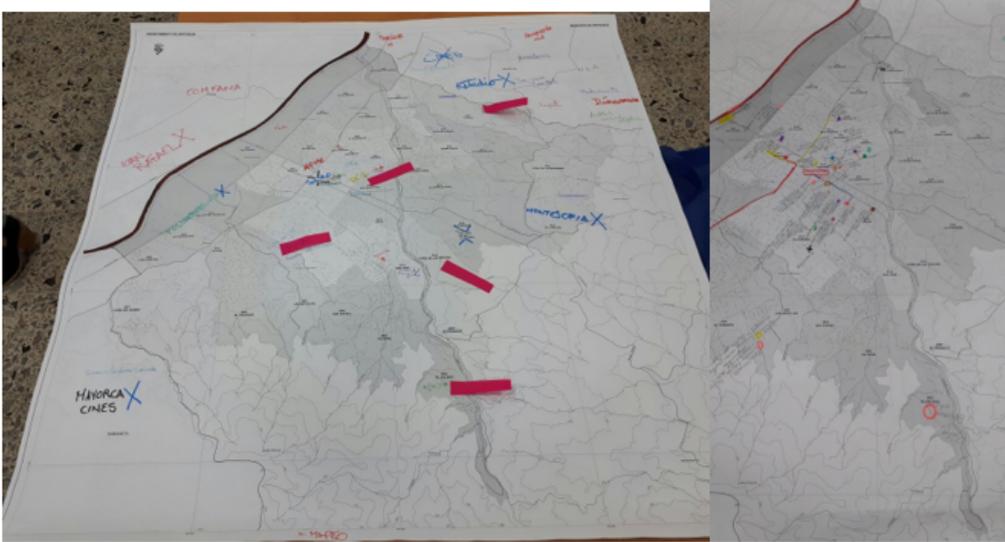


Figure 1

Community assets that participants visited or identified in the City of Envigado over one week. Left - assets identified by PWDs; Right - assets identified by rehabilitation professionals.

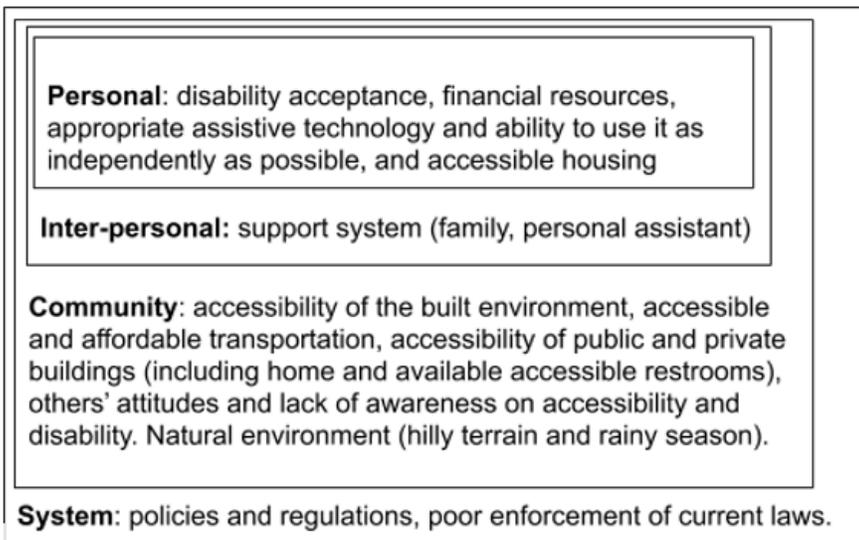


Figure 2

Facilitators and barriers to access and use community assets at the personal, and inter-personal, community, and system level as per the socio-ecological framework proposed by Bronfenbrenner (19).

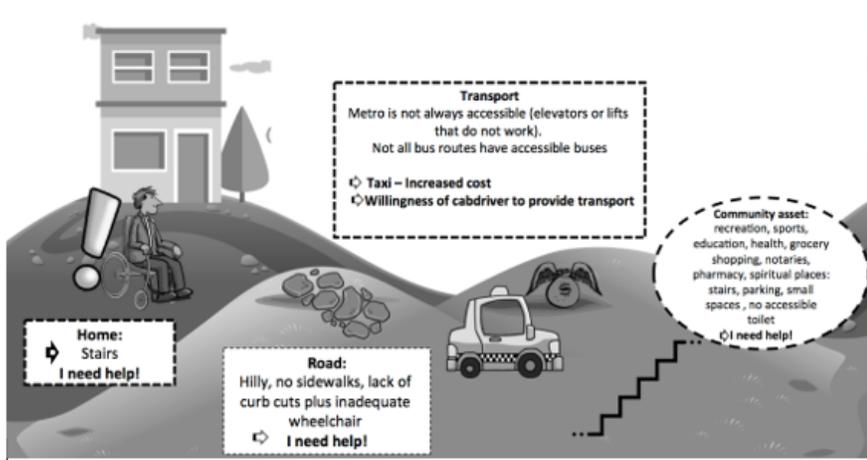


Figure 3

For people with mobility impairments in Envigado enjoyment of community assets is hindered because they cannot fully exercise their right to personal mobility.