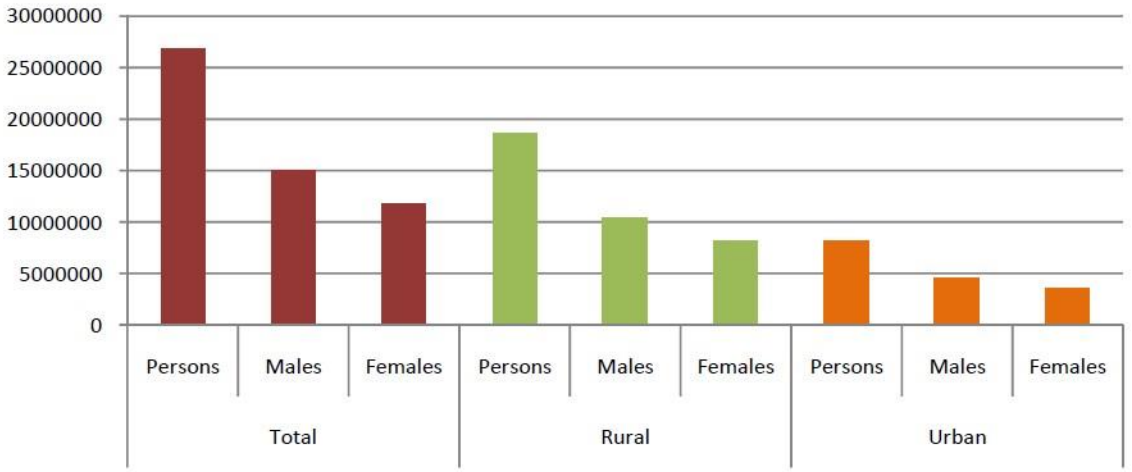
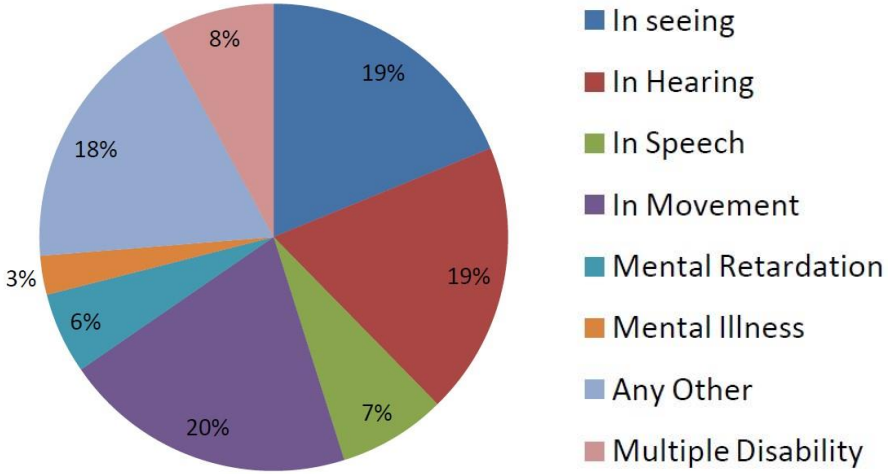


Number of disabled persons in India.

Population, India 2011			Disabled persons, , India 2011		
Persons	Males	Females	Persons	Males	Females
121.08 Cr	62.32 Cr	58.76Cr	2.68 Cr	1.5 Cr	1.18 Cr



Percentage of total disabled persons by disability type.

PROBLEM STATEMENT

Main Problem

The current myoelectric upper-limb prostheses possess limited functionality and unreasonable cost. The devices are either unaffordable to common Indian amputees or abandoned due to inability to provide satisfactory, intuitive and functional restoration of the lost limb. In either case, amputees are unable to perform activities related to working, social and daily living.

Occurrence

There are about 28 million disabled persons in India; out of which 20% are having disability in movement. This includes upper-limb amputees having unilateral/bilateral amputations due to accidental, pathological, or congenital causes. The population contributes to a significant part of Indian society with majority of people living in rural or under-developed parts of the country. Every year approx. 23,500 amputees are added to this population in India.

Visualization

The project team was in contact with a bilateral trans-radial amputee who survived a train accident. Two types of prosthesis were considered for him; namely body-powered and myoelectric prosthesis. The former was provided by an NGO. It was heavy, bulky, non-functional; and therefore, abandonment by the amputee. The myoelectric prosthesis was being sold by a clinical prosthetist from Delhi. It costed around 5-6 lakhs and provided only one degree of freedom (hand open/close). The two factors made the family to decide not to opt a prosthesis and adapt to their condition without limbs. Upon realization of the problem, subsequent market and literature studies were conducted to investigate academic and clinical state-of-the-art. The technological gaps leading to the problem were then identified by the team.

Importance

A large number of PWDs (person with disability) in movement including upper-limb amputees live in rural areas (71%). They have a literacy rate of 55%, and employment rate of only 7.5%. Also, 50% are dependent on others for daily necessities. This infers that the social and financial condition of the amputees is below satisfactory levels. A large part of Indian society is not able to perform tasks for daily living and/or livelihood; leading to decreased standard of life, confidence and self-esteem with minimal social acceptance and loss of human resource. Therefore, an effective alternative to current clinical prosthesis in terms of financial and functional perspective is needed. This would enable the amputee to acquire adequate skills to perform daily living, working and social activities so as to reduce dependency, enhance their quality of life through employment and social acceptance. The amputees provided with affordable and multifunctional prosthesis would be able to address the societal challenges.