

# **Costs of Dementia in Low and Middle Income Countries (LAMIC): Findings from the 10/66 project**

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# Background

- ◆ **AGEING** In 2020 1.2 billion people will be 60 and over, 71% in LAMICs. This may lead to dramatic change in the patterns of diseases.
- ◆ **DEMENTIA** In 2020 40 million people will have dementia, 2/3 in LAMICs
- ◆ **COSTS** The worldwide costs of dementia are enormous(1% of GDP) and are expected to increase particularly in LAMICs
- ◆ **BURDEN** Health and Welfare systems in LAMICs are not designed for chronic conditions and elderly. The burden and costs of dementia are dealt with by the families of the patients and are expected to increase substantially

# Rationale for investigating the costs of dementia

- ◆ Cost studies can inform the policymakers
  - ★ To estimate savings could occur if there is an intervention
  - ★ To realise insufficient research investment
- ◆ Identify the resources which should be included in economic evaluations
- ◆ Contribute to developing new strategies

# Rationale for the current study

- ◆ Dementia is a disease that is becoming increasingly prevalent and affects the elderly in LAMICs where the welfare systems are least able to cope.
- ◆ Findings on the cost of dementia based on robust methodologies will highlight a large and growing problem and provide policy makers with important information.
- ◆ Evidence on the costs of dementia are lacking in LAMICs.

# Aim and objectives

**Aim: To assess the impact of dementia in LAMICs**

## **Objectives:**

- To calculate the costs of dementia in LAMICs based on recognised cost-of-illness methods
- To identify demographic and clinical predictors of dementia costs in LAMICs
- To estimate the cost that can be attributed to the dementia

# Design of the 10/66 study

## METHODS

One-phase survey of residents aged 65+ in 7 LAMICs

Using the 10/66 validated protocol

## OUTCOME

Dementia diagnosis (10/66 and DSM IV) (*severity by CDR*)

## EXPOSURES

Physical health, anthropometry, demographics, risk factors

## IMPACT

Disability/functioning, health service utilisation, care arrangements and caregiver burden

# Design of the cost study

- ◆ **Prevalence-based study**
- ◆ **Bottom up cost-of-illness study**
- ◆ **Included costs**
  - ★ **Cost of medical care: provided by healthcare professionals**
  - ★ **Cost of social care**
    - ◆ Informal care: provided by unpaid family members
    - ◆ Paid home care: including non-professional help



# Perspective

- ◆ **Public level**
  - ★ Medical care, the cost of government funded services
  - ★ Social costs, values are based on average income
- ◆ **Private level:**
  - ★ Family and patient costs, including out-of-pocket expenses and time spent using services and travelling to use them
  - ★ Social costs, values are based on individual income lost.

# Measurements of cost

- ◆ Medical services: including contact with
  - ✦ primary care health professionals
  - ✦ public hospital doctors
  - ✦ other publically provided professionals
  - ✦ private health care services (including private doctors, dentists, and traditional healers)
- ◆ Period: in the past three months

# Measurements of cost

- ◆ Informal care: helping with
  - ★ Activities of daily living (ADLs): dressing, eating, grooming, toileting, and bathing
  - ★ Instrumental activities of daily living (IADLs): transportation and communication
  - ★ Supervision
  - ★ Period: in the past 24 hours
- ◆ Paid home care: day and night
  - ★ In the past week

# Valuing the cost

- ◆ **Medical care:**

- ◆ Public level: according to country specific unit cost based on UK unit costs and WHO-CHOICE ratios.
- ◆ Private level: out-of-pocket expenses

- ◆ **Informal care (human capital approach):**

- ◆ Public level: based on average wages
- ◆ Private level: based on real salary loss

- ◆ **Paid home care**

- ◆ Public and private level: based on minimum wages

# Currency and time issue (Cost in 2008)

- ◆ Purchasing power parities (PPPs): exchange rates which aim to make adjustments to equalise the purchasing power of different currencies
  - ✦ the WHO Global Health Expenditure Database
- ◆ Consumer price index (CPI): measures changes in the prices of goods and services that households purchase across years
  - ✦ the International Labour Organization Labour Statistics Database

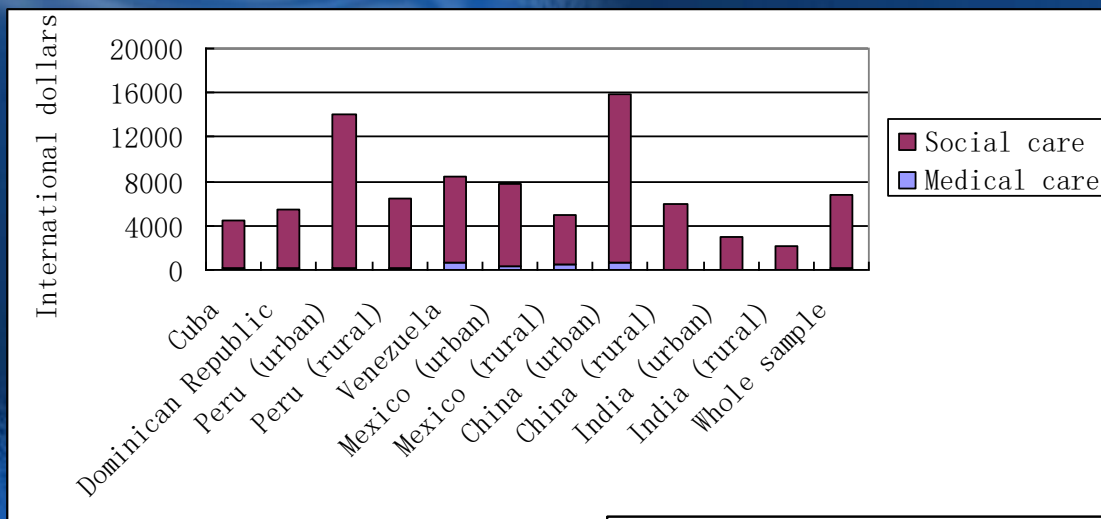
# Statistical methods

- ◆ Cost data: highly skewed, with a large number of zero cost
- ◆ Bootstrapped linear regression modelling for the predictors and attributable cost
  - ✦ Bootstrapping is a method of randomly repeated independent sampling with replacement from the original database. After the bootstrapping procedure, simulated samples of the same size as the original database can be created and used for constructing confidence intervals and conducting statistical tests.

# Results

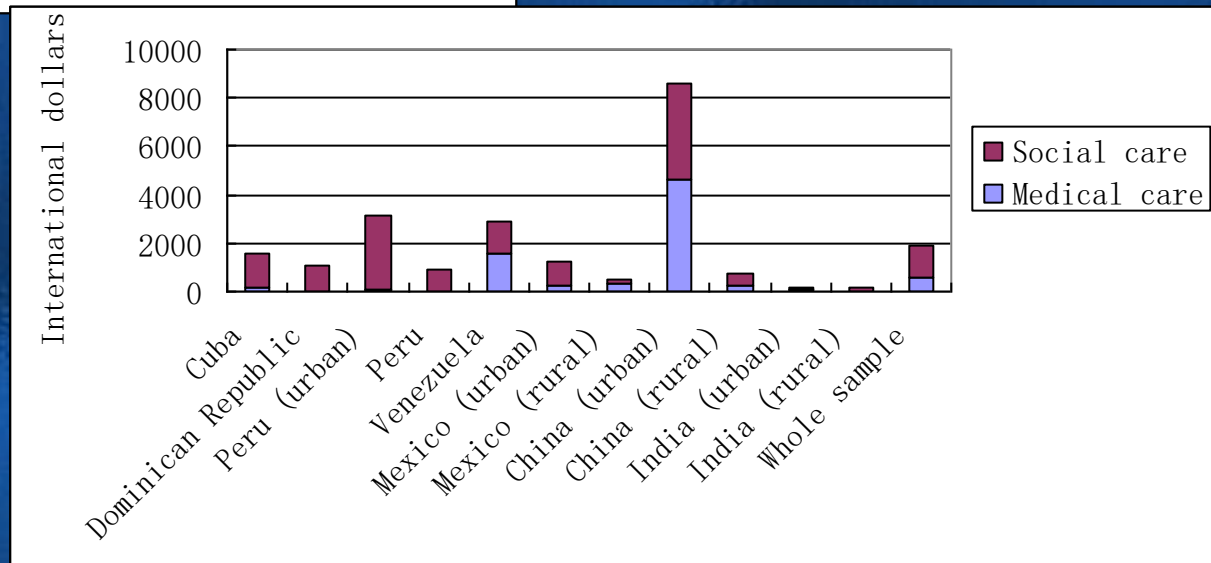
- ◆ Total costs of dementia
- ◆ Predictors of cost
- ◆ Cost attributed to dementia

# Total mean cost of dementia, by site



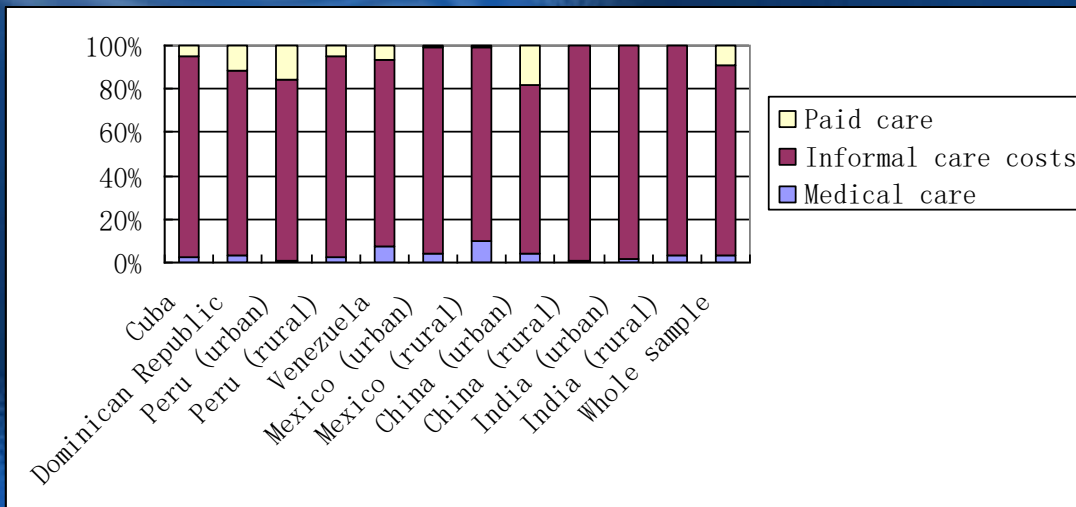
**Public level  
\$6750**

**Private level  
\$1183**



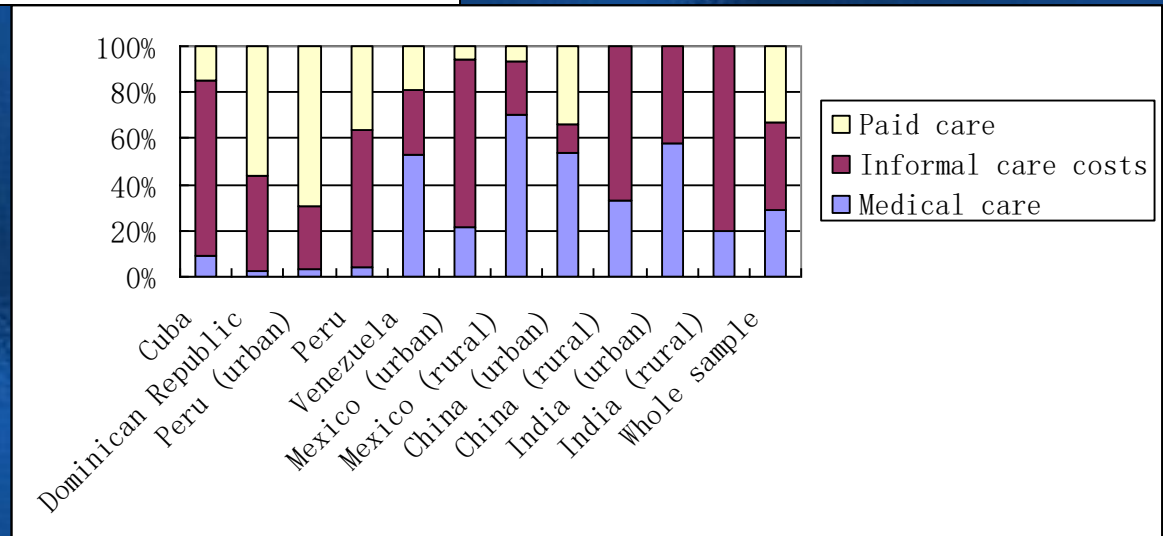


# The distribution of cost of dementia, by site



**Public level**

**Private level**



# Predictors of cost

- ◆ Physical impairment and Behavioural and psychological symptoms of dementia (BPSD) led to higher costs of informal care, but not for medical care.

# Cost attributed to dementia

Type of cost	Cuba	Dominica n Republic	Peru	Venezuela	Mexico	China	India	Whole sample
Medical care	-5.5	-44	-42	296	16	148	-29	12
Social care	3856*	3847*	10375*	3201*	4765*	8540*	1793*	5114*
Informal care	3658*	3433*	8870*	2986*	4720*	7344*	1793*	4653*
Paid home care	198*	415*	1505*	215	45	1195*	-	493*
Total cost	3851*	3804*	10332*	3497*	4781*	8687*	1764*	5164*

\* Statistically significant at 95% level of confidence

# Cost attributed to dementia

- ◆ The average attributable costs of dementia (I\$5164) were higher than that for stroke (I\$2218), depression (I\$705) or diabetes (I\$420).

# Cost attributed to dementia, by severity

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Severity	Per capita	Prevalence
Mild	I\$662	3.6%-9.0%
Moderate	I\$11910	0.6%-2.4%
Severe	I\$13863	0.1%-1.8%

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# Discussions

- ◆ Estimates of total dementia costs are substantial and most of the care is due to support from unpaid family members. Interventions should be introduced both for dementia patients and their carers in the early stages of the condition dementia, so as to decrease the cost as well as improving quality of life.

# Discussions

- ◆ Although patients with severe dementia have higher average total costs, at a country level the overall cost of mild dementia is dominant. Evidence-based intervention should be provided for those with mild dementia, delaying the progression of the condition, so as to decrease the cost of dementia at a country level.

# Discussions

- ◆ Compared with stroke, diabetes, ischemic heart disease and COPD, dementia results in higher social care costs. More research fund should be allocated to dementia in the future.



# Discussions

- ◆ Results from this study are difficult to directly compared with findings from other studies. This is mainly due to methodological issues which occur in the various steps of the calculations (identification, measurement, valuation). Future discussion should be made to establish standard methods to guide the conduct of cost-of-illness studies.



**Thank you!**