Cost-effectiveness of childhood cancer treatment units in resource-constrained settings

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PAHO Caribbean Childhood Cancer Meeting

Feb 11, 2020

Port of Spain, Trinidad and Tobago

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Background

- Major barrier to creating childhood cancer (CC) policies is the lack of data on the cost and cost-effectiveness of delivering CC treatment
- Assumption that CC treatment too expensive for LMIC health systems
- Leads to lack of priority afforded to development of CC treatment delivery

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Can we determine the cost and cost-effectiveness associated with delivering CC treatment in a diverse range of established treatment units in resource-constrained settings?

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The Lancet Oncology/The Lancet Cancer Campaign

Cancer burden | Risk factors and policy | Past Commissions | Paediatric Cancer

Paediatric Cancer

Cancer kills more than 100,000 children each year, and yet 80% of paediatric cancers are treatable with currently available interventions. Notably, the majority of these deaths occur in low-to-middle-income countries where children have poor access to health services. It is crucial that as countries transition to universal health care, childhood cancers are recognised as a priority for inclusion in benefits packages. Yet no reliable data are available in low-to-middle-income countries on current and future burden of childhood cancer; on cost of effective interventions; on current coverage levels for diagnostic, treatment, and care services; or on the cost, feasibility, or health and

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El Salvador

Ghana

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	Korle Bu Teaching Hospital	Hospital Nacional de Ninos Benjamin Blum	Hospital Civil de Guadalajara
Jurisdiction	Ghana	El Salvador	Jalisco, Mexico
GDP per capita (USD, 2016)	1,513	3,920	8,208
Population served, estimated	19.7 million	6 million	5 million
Other childhood cancer treatment units within jurisdiction	In addition to Korle Bu, one additional childhood cancer treatment unit exists in Ghana in the city of Kumasi estimated to serve the rest of Ghana's population	No	Two small private hospitals and one other public hospital estimated to reach the other 3 million in Jalisco
Satellite centres	No	No	No
New childhood cancer cases annually	170	180	165
Age range	0-14 years	0-14 years	0-14 years
Paediatric oncology beds	30	24	31
Medical personnel, FTE	41	65	110
Average outpatient visits per day	7	90	57
Public financing of childhood cancer treatment	A National Health Insurance Authority exists but does not cover all medications and services. Private philanthropic funding also exists	Financing provided mainly by the Ministry of Health and the private non-profit foundation "Ayudame a Vivir"	Public insurance (Seguro Popular) covers pediatric cancer
Examples of caregiver medical costs not covered by public or philanthropic funds	Fundraising underway to expand hostel for parents of patients; Most parents have to cover costs of many diagnostics and treatment	Most costs are covered through government and philanthropic funding	Most costs covered by state and federal government, except for local housing for parents where foundation support is available
Treatment modalities available	Chemotherapy, surgery, radiation (limited)	Chemotherapy, surgery, radiation (not on-site)	Chemotherapy, surgery, radiation (not on-site), BMT
Five year overall survival	35%*	49%	73%

Costs

- Determine annual costs of maintaining each treatment unit using previously trialed costing tool
- Breakdown into components (e.g. personnel, medications, diagnostics, overhead)
- Some data available retrospectively
- Most collected prospectively over a 2-4 week period

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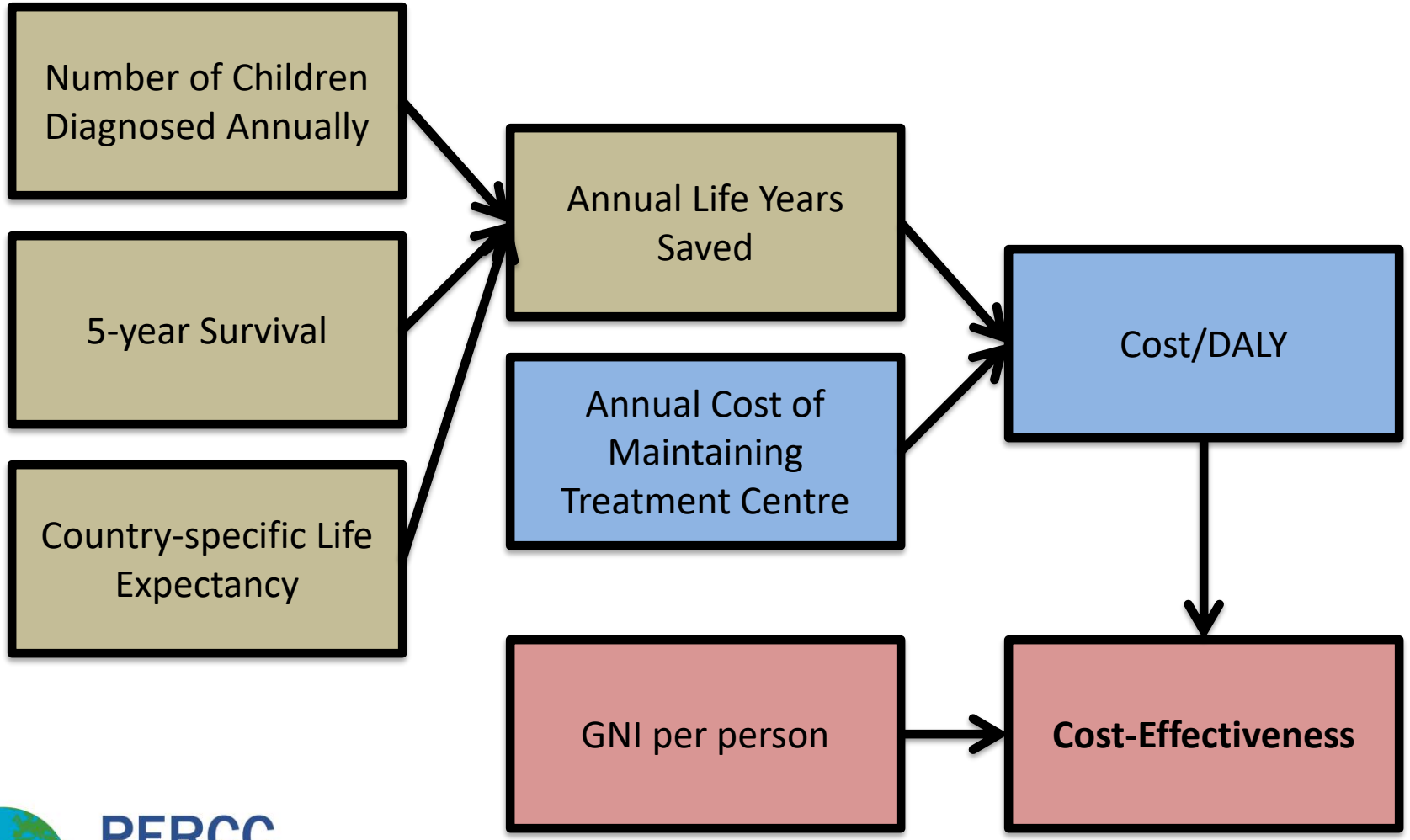
Cost-Effectiveness



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Cost-effectiveness

- Ratios of Cost/DALY saved to GNI under 3 considered cost-effective
- Ratios of Cost/DALY saved to GNI under 1 considered very cost-effective
- Some debate about these thresholds

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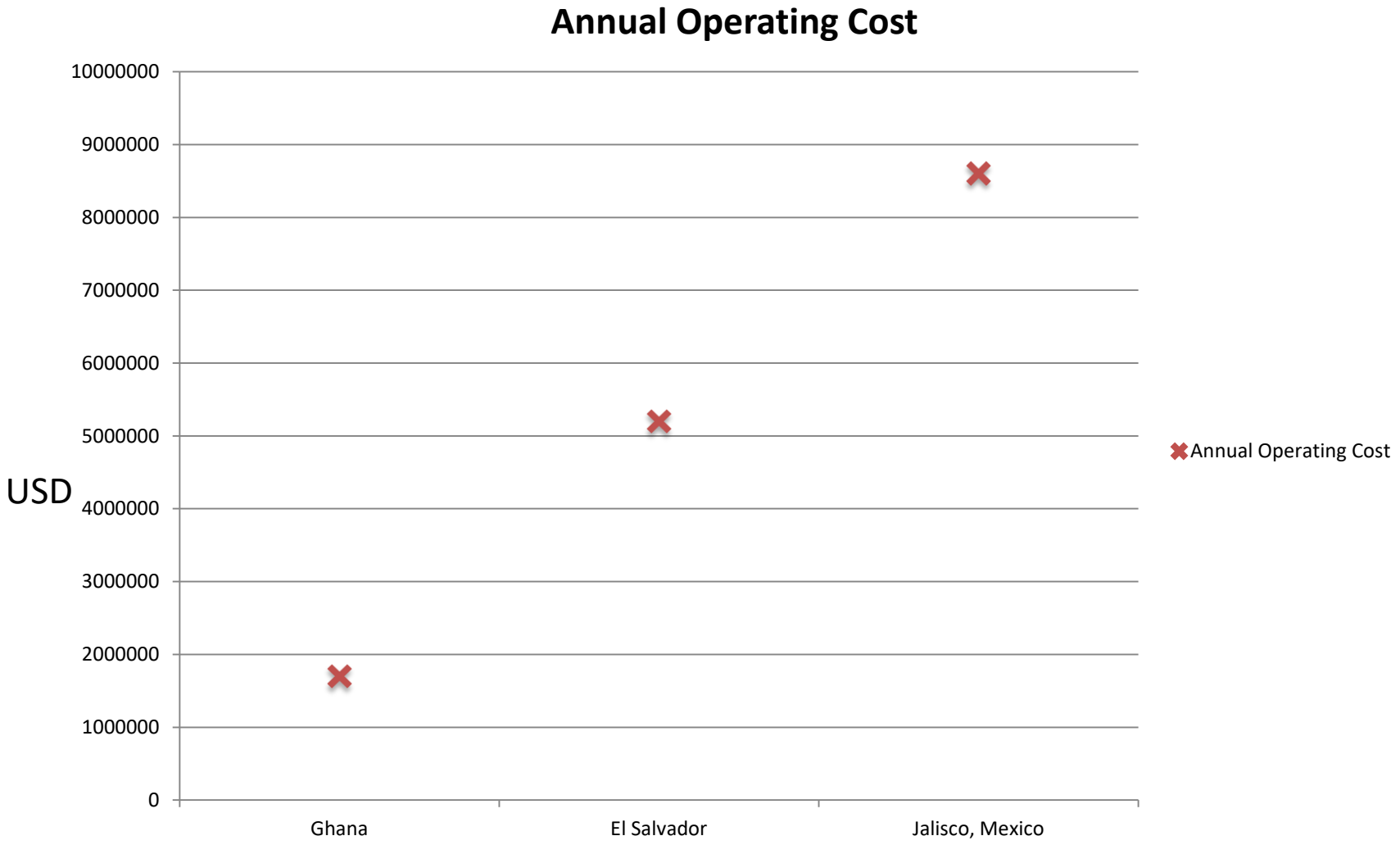

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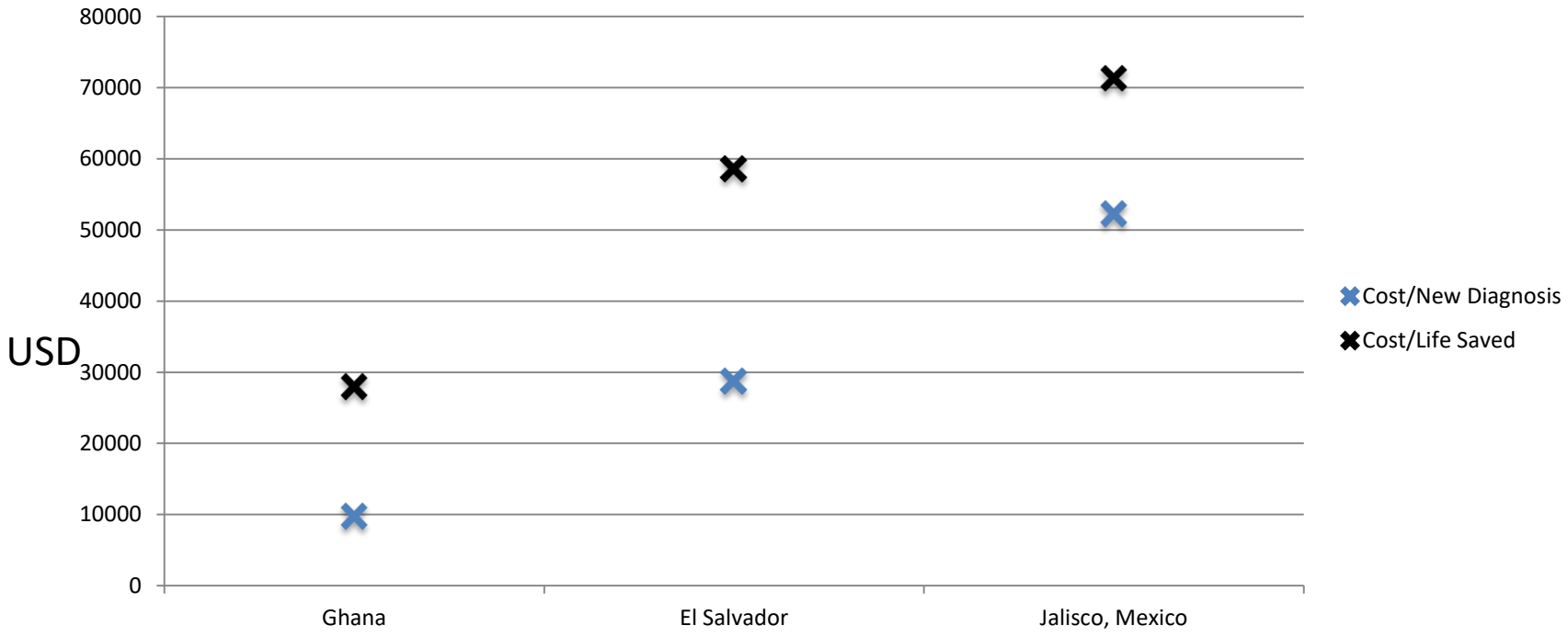

- Ratio of cost/new diagnosis to GDP remarkably consistent (6.5, 6.8, 6.3)

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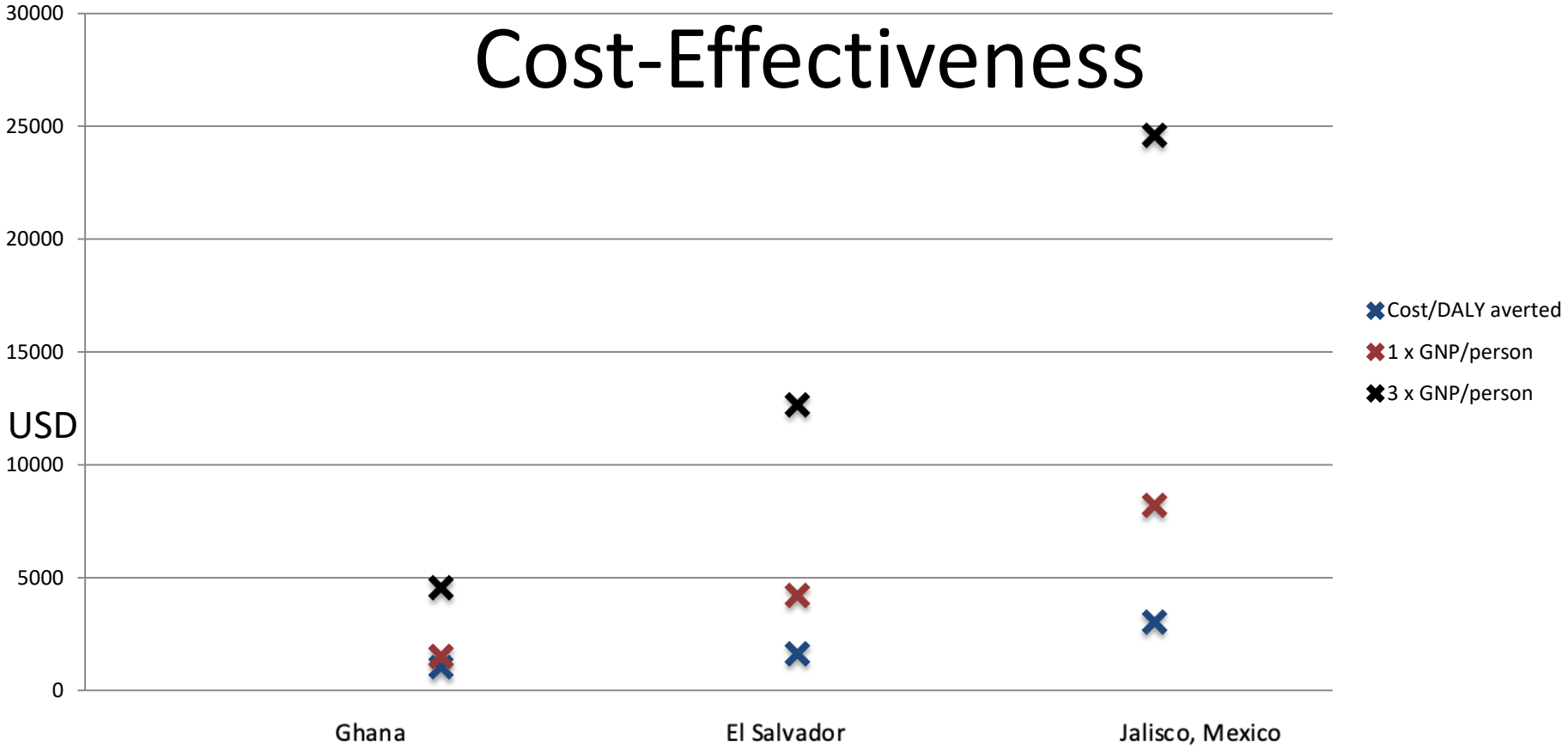
Cost-Effectiveness



Cost/DALY averted Per capita GNI	0.68	0.41	0.31

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Key Points

- Across the range of settings represented by the three LMIC centres, childhood cancer treatment units represented very cost-effective interventions
  - Despite major differences in services provided and outcomes achieved
  - This range almost certainly encompasses the various childhood cancer treatment units in the Caribbean region

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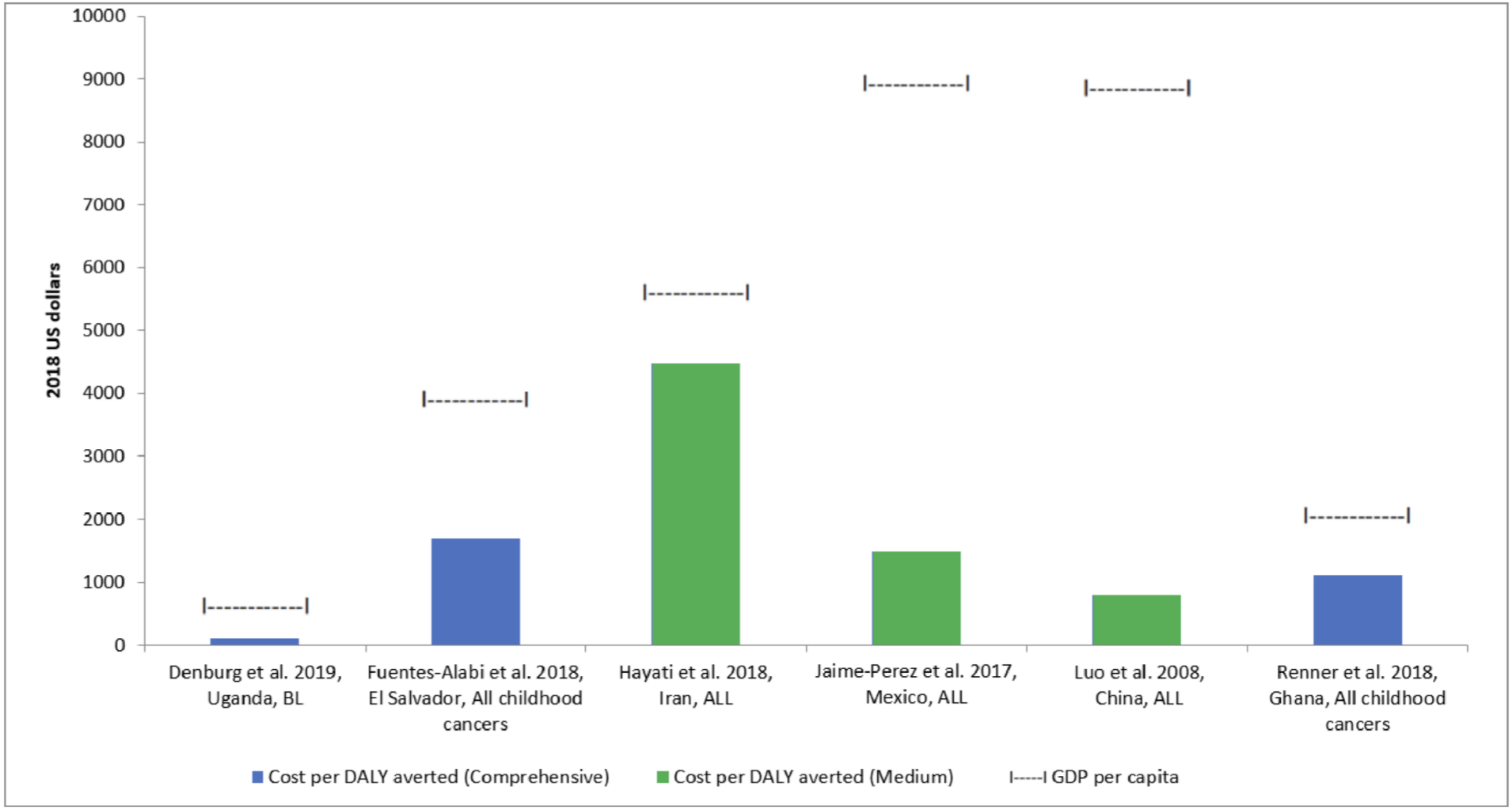
BMJ Global Health

Cost and cost-effectiveness of childhood cancer treatment in low-income and middle-income countries: a systematic review

Alastair Fung,[1] Susan Horton,[2] Veda Zabih,[3] Avram Denburg,[3,4] Sumit Gupta[3,4]



Key Points

- Comparisons to cost-effectiveness of select interventions targeting childhood infections or adult cancers

Country	Study	Intervention	Cost per DALY averted (USD)
Ghana	Nonvignon et al. 2017[23]	Rotavirus vaccine	238-332 (2015 USD)
Ghana	Pitt et al. 2016[24]	Newborn home visits	352 (2009 USD)
Ghana	**Renner et al. 2018[11]**	**Childhood cancer treatment unit**	**1,034**
Ghana	Zelle et al. 2012[25]	Biennial screening clinical breast exams and treatment, women aged 40-69	1,299 (2009 USD)
El Salvador	**Fuentes-Alabi et al. 2018[10]**	**Childhood cancer treatment unit**	**1,624**
El Salvador	Campos et al. 2015[26]	Screen and treat strategy for cervical cancer	2,040 (2012 USD)
Mexico	**Current**	**Childhood cancer treatment unit**	**2,559**
Mexico	Niens et al. 2014[27]	Biennial mammography and treatment, women aged 50-70	1,833 (2012 USD)

Key Points

- Cost-effectiveness does not necessarily equal affordable…. But…
- Overall outlays for childhood cancer are small compared to overall health system or even cancer care budgets
- Financing discussions nonetheless crucial
  - Advantages in the Caribbean region?
  - Role of philanthropy?

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Acknowledgments

All other authors
and data collectors

CIHR IRSC

Veda Zabih

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Questions

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