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The U.S. Government's Global Hunger & Food Security Initiative

Safe Food, Fair Food for Cambodia

Cost of hospitalization for foodborne diseases

SFFF Cambodia Taskforce and Stakeholder Meeting
Siem Reap, 24-25 October 2019





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OUTLINE

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THE GLOBAL BURDEN OF FOODBORNE DISEASE



The burden of foodborne diseases is substantial

Every year foodborne diseases cause:


almost **in 10** people to fall ill | **33 million** healthy life years lost

Foodborne diseases can be deadly, especially in children <5


420 000 deaths | Children account for **1/3** of deaths from foodborne diseases

FOODBORNE DISEASES ARE PREVENTABLE. EVERYONE HAS A ROLE TO PLAY.

For more information: www.who.int/foodsafety
#SafeFood
 Source: WHO Estimates of the Global Burden of Foodborne Diseases, 2015.



World Health Organization



Foodborne diseases in the WHO African Region


Every year

>91 million people fall ill } **137 000** people die representing **1/3** of the global death toll for foodborne diseases

| | |
|--|--|
| <p>Diarrhoeal diseases are responsible for 70% of the burden of foodborne diseases</p> <ul style="list-style-type: none"> Non-typhoidal <i>Salmonella</i> Foodborne cholera <i>E. coli</i> | <p>Chemical hazards (cyanide and aflatoxin) cause more than 3000 deaths annually</p> <p>Paralysis (Konzo) caused by cyanide in cassava, is unique to the African Region, resulting in death in 1 in 5 people affected</p> |
|--|--|

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World Health Organization



The most frequent causes of foodborne illness were diarrhoeal disease agents





INTRODUCTION

Cambodia: Few studies

- The cases of diarrhoea: >> *E. coli* and rota virus → Often foodborne.
- In adults, *Salmonella*
- *Salmonella spp* in adult: 44 fold higher, 2013: 2007
- *Salmonella paratyphi* caused 85% diarrhoea during 2013-2015 compared to 25.5% in 2008-2012.
- Most of microbial agents which cause diarrhoea: resistant to antibiotics
- The prevalence of the diseases: the tendency of increasing of the treatment cost over the years



COST OF ILLNESS ANALYSIS ?

- Cost-of-Illness (COI) studies aim to identify and measure all the costs of a disease
- COIs estimate the economic burden of a specific disease to a society \approx the savings that could be done if the disease were to be eradicated
- The most developed cost estimation strategies and data sources relate to estimating:
 - direct health-sector costs and
 - indirect costs associated with a sick persons' lost earnings (productivity losses)

This study aims to estimate the costs of hospitalization for foodborne diseases in selected health facilities in the country.





MATERIALS AND METHODS

| Analytical framework | Details |
|----------------------------------|---|
| Design | A facility-based cost-of-illness study |
| Study perspective | Societal perspective using retrospective approach |
| Epidemiological approach | Prevalence-based study |
| Sources of data for direct costs | Selected health facilities in Cambodia |
| Indirect cost estimation methods | Human capital approach |

| | | |
|-----------------------------|---|--|
| Study setting | | |
| Level | Health facility visited | |
| National | NPH: National Pediatric Hospital KH: Kossamak Hospital | |
| Provincial/referral | Siem Reap <ul style="list-style-type: none"> • Siam Reap provincial hospital (Regional Hospital)=CPA3 | |
| District | Phnom Penh <ul style="list-style-type: none"> • SRH: Samdeach Or Referral Hospital=CPA1=Ruessei Kaev (Samdeach Or Referral Hospital) • DRH: Dangkor Referral Hospital=CPA1 • MRH: Meanchey Referral Hospital=CPA1=Chbar Ampov (Meanchey Referral Hospital) • Sen Sok Referral Hospital=CPA1 • Pou Senchey Referral Hospital=CPA1 • Angkor Chum Referral Hospital=CPA1 • Sotr Nikum Referral Hospital=CPA2 | |
| Commune health center (MPA) | <ul style="list-style-type: none"> • Tuol Kouk Health Center • Teuk Thla Health Center • Steung Meanchey Health Center • Samraong Kraom Health Center | <ul style="list-style-type: none"> • Ponhea Pon Health Center • Boeng Thom Health Center • Anlong kngan Health Center |



| | |
|--------------------|---|
| Selection of cases | <ul style="list-style-type: none">• The data collection: January 2018 and July 2019• Using hospital medical records• All suspected cases of foodborne diarrhoea as diagnosed by doctors |
| Data collection | <p>Direct medical costs: The costs relating directly to the patients while undergoing medical care: Diagnostics procedures, lab test, medicine, medical consumables, capital costs, overhead, admin and overhead/facility costs. → Hospital Data: Med. Record + Patient interview</p> <p>Direct non-medical cost: Patient and their caregiver costs of travels, food, accommodation, and other related costs: → Patient interview</p> <p>Indirect costs: Productivity losses of the patients and/ or their caregivers. → Patient interview</p> |



Analysis

- Case descriptive and characteristics
- Cost descriptive:
 - Direct medical cost, direct non-medical cost, and indirect cost (in USD)
- Analysis:
 - Comparison between type of healthcare facilities
 - Comparison between diagnosis cases



Results: Characteristics of patients of the study

| Parameters | National Hospitals | Referral Hosp. | Regional Hosp. | Com. Clinics | Overall |
|---------------------------------|--------------------|----------------|----------------|--------------|------------|
| Number of patients | 44 | 60 | 100 | 62 | 266 |
| Gender: | | | | | |
| • Men [n (%)] | 21 (47.7) | 16 (26.7) | 35 (35) | 27 (43.5) | 99 (37.2) |
| • Women [n (%)] | 23 (52.3) | 44 (73.3) | 65 (65) | 35 (56.5) | 167 (62.8) |
| Average of age [year] | 18.19 | 29.5 | 39.5 | N/A | 32.1* |
| Average of length of stay [day] | 2.36 | 1.83 | 3.5 | 1 | 2.34 |
| Patient diagnosis: | | | | | |
| • Food poisoning [n (%)] | 27 (61.4) | 36 (60.0) | 0 | 2 (41.9) | 65 (24.4) |
| • Acute diarrhea [n (%)] | 17 (38.6) | 21 (35.0) | 100 (100) | 60 (58.1) | 198 (74.4) |
| • Typhoid [n (%)] | 0 | 2 (3.3) | 0 | 0 | 2 (0.8) |
| • Chronic diarrhea [n (%)] | 0 | 1 (1.7) | 0 | 0 | 1 (0.4) |

266 cases collected from 3 levels of hospital and health facilities





Cost of per episode of hospitalization of FBD by group of health facilities

| Cost | National Hospital (n=44) | Referral Hospital (n=60) | Regional Hosp. (n=100) | Community Clinic (n=62) | Overall (n=266) |
|--------------------------------|--------------------------|--------------------------|------------------------|-------------------------|-----------------|
| Direct medical cost | | | | | |
| • Amount [usd] | 125.77 | 9.42 | 27.85 | 4.19 | 34.38 |
| Direct non-medical cost | | | | | |
| • Amount [usd] | 40.64 | 8.36 | 26.33 | 0.30 | 18.58 |
| Indirect cost | | | | | |
| • Amount [usd] | 21.43 | 6.38 | 10.89 | 3.08 | 9.80 |
| Total cost [usd] | 185.88 | 24.16 | 65.07 | 7.57 | 62.76 |

Direct cost of per episode of hospitalization of FBD by patients

| Cost | National Hospital (n=44) | | Referral Hospital (n=60) | | Regional Hospital (n=100) | | Community Clinic (n=62) | | Overall (n=266) | |
|------------------------------------|--------------------------|------------|--------------------------|------------|---------------------------|------------|-------------------------|------------|-----------------|------------|
| | usd | % | usd | % | usd | % | usd | % | usd | % |
| Direct medical cost | | | | | | | | | | |
| • Hospital charge | 58.64 | 35.2 | 4.08 | 22.9 | 16.9 | 31.19 | 1.21 | 27.6 | 17.26 | 32.6 |
| • Medicine | 65.84 | 39.2 | 5.33 | 30.0 | 9.75 | 19.00 | 2.98 | 66.4 | 16.45 | 31.1 |
| • Lab | 1.29 | 0.8 | 0.0 | 0.0 | 1.43 | 2.64 | 0 | 0 | 0.75 | 1.4 |
| Direct non-medical cost | | | | | | | | | | |
| • Travel | 12.74 | 7.7 | 1.81 | 10.18 | 6.35 | 11.72 | 0.30 | 6.7 | 4.97 | 9.3 |
| • Accommodation | 4.32 | 2.6 | 0.0 | 0.0 | 2.09 | 3.84 | 0 | 0 | 1.50 | 2.8 |
| • Meal | 23.31 | 14.0 | 6.56 | 37.0 | 17.90 | 33.04 | 0 | 0 | 12.06 | 22.8 |
| Total direct cost | 166.40 | 100 | 17.78 | 100 | 54.18 | 100 | 4.49 | 100 | 52.90 | 100 |
| (Daily average direct cost) | (73) | | (11.97) | | (17.57) | | (4.49) | | (26.70) | |

Cost of per episode of hospitalization of FBD by main diagnosis

| Cost | Food Poisoning (n=65) | Acute Diarrhea & others (n=201) | Overall (n=266) |
|---------------------------------------|--------------------------|------------------------------------|--------------------|
| Direct Medical Cost | | | |
| • Amount [usd] | 29.30 | 36.97 | 34.38 |
| • (% total cost) | (58.7) | (54.3) | (55.1) |
| Direct Non-Medical cost | | | |
| • Amount [usd] | 12.09 | 20.79 | 18.58 |
| • (% total cost) | (24.2) | (30.5) | (29.8) |
| Indirect Cost | | | |
| • Amount [usd] | 7.68 | 10.39 | 9.80 |
| • (% total cost) | (15.4) | (15.3) | (15.7) |
| Total Cost [usd, (%)] | 49.88 (100) | 68.15 (100) | 62.76 (100) |
| Average Daily Total Cost [usd] | 35.74 | 24.09 | 26.70 |



Limitation

- Not counting government contribution for hospitalization cost in public hospital
- Not counting capital cost: med staff salary and overhead: due to lack of access to data & hospital filing problem

Conclusion

- Cost of hospitalization of FBD in Cambodia is relatively high: 62 USD/case.
- The attention should be paid more on prevention program: such as ensuring food safety in all food value chain through improving public knowledge and awareness.



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Next steps

- Shared with hospitals
- Publication



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www.feedthefuture.gov

