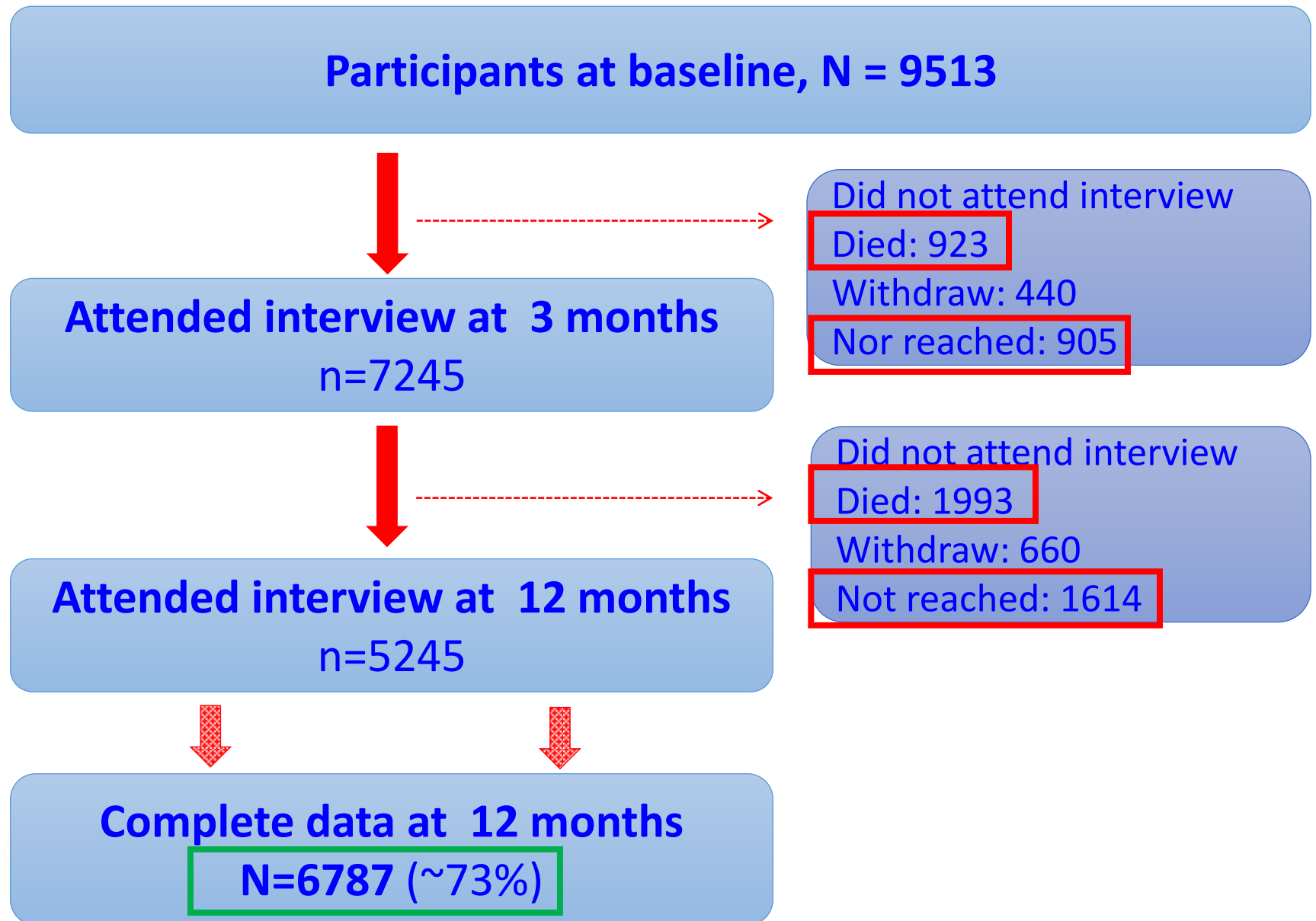


# Prioritizing strategies to address the economic impact of cancer in Southeast Asia

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# ASEAN CoST In Oncology (ACTION) study flow



# A closer look...

Country	Per capita GDP (USD) <sup>a</sup>	Age- standardized cancer incidence (per 100 000) <sup>b</sup>	Financial catastrophe at 1 year	Death at 1 year
Malaysia	10 830	143.6	621/1373 (45%)	158/1373 (12%)
Thailand	5 561	137.5	249/1058 (24%)	276/1058 (26%)
Indonesia	3 515	133.5	486/1097 (44%)	405/ 1097 (37%)
Philippines	2 843	140.0	369/660 (56%)	240/660 (36%)
Vietnam	2 052	140.4	1016/1490 (68%)	370/ 1490 (25%)
Laos	1 708	141.8	11/56 (20%)*	45/56 (80%)*
Myanmar	1 198	140.5	495/995 (50%)	445/995 (45%)
Cambodia	1 084	140.4	1/58 (2%)*	54/58 (93%)*

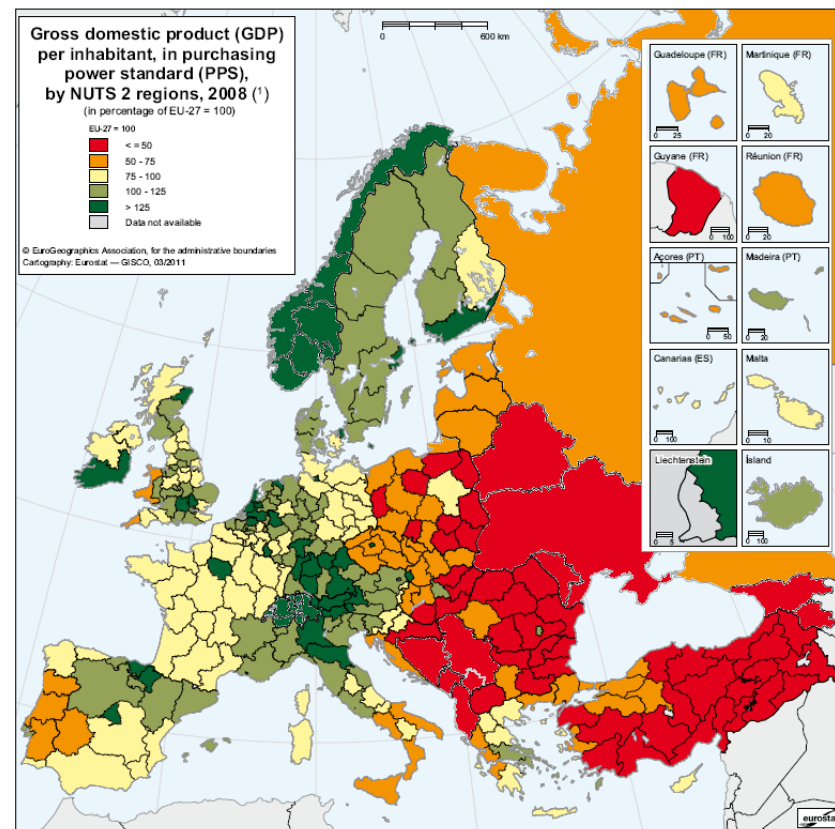
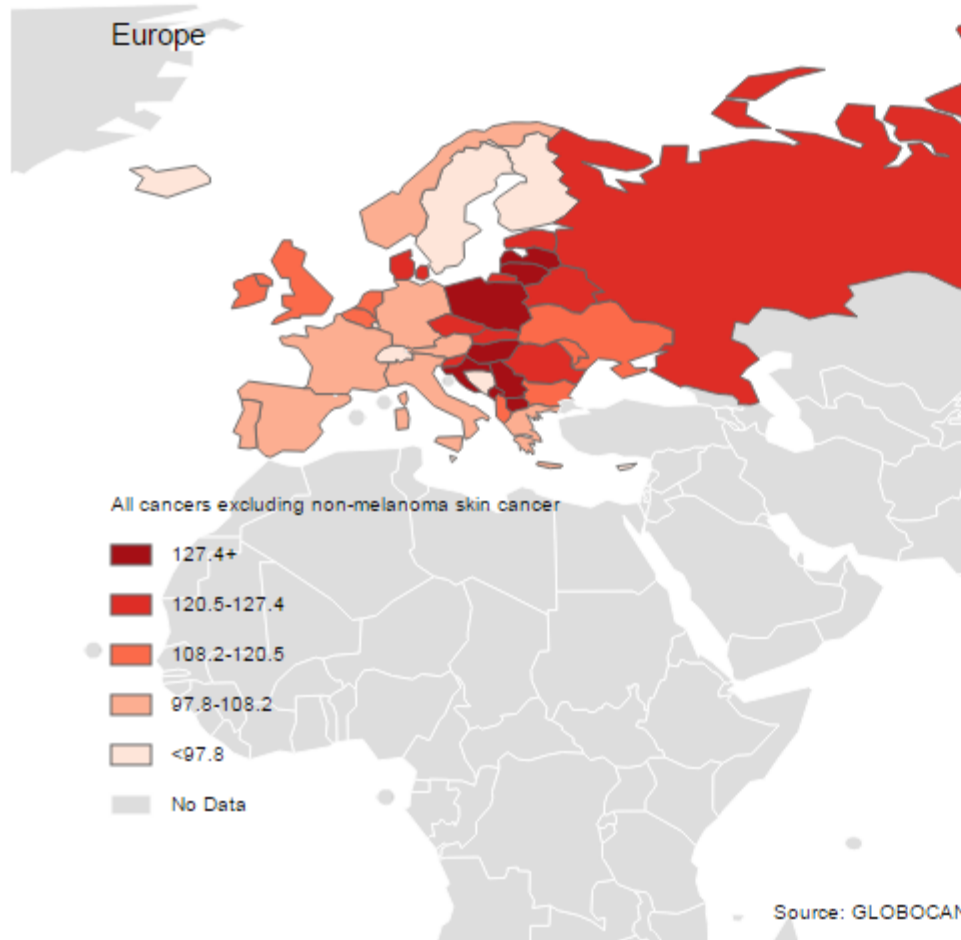
<sup>a</sup> Estimates for 2010-2014 by the World Bank <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

<sup>b</sup> Estimates from GLOBOCAN 2012 [http://globocan.iarc.fr/Pages/summary\\_table\\_pop\\_sel.aspx](http://globocan.iarc.fr/Pages/summary_table_pop_sel.aspx)

Mortality ASR

Both sexes

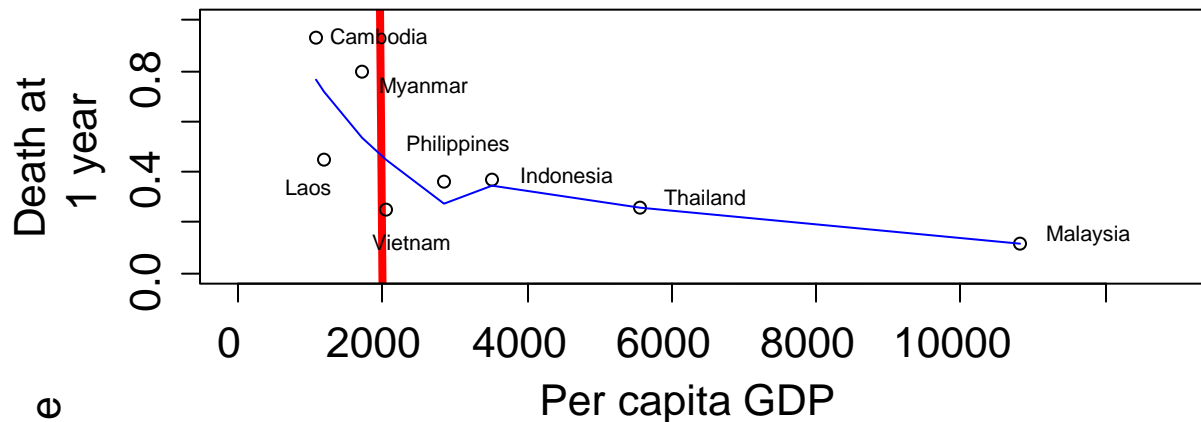
Europe



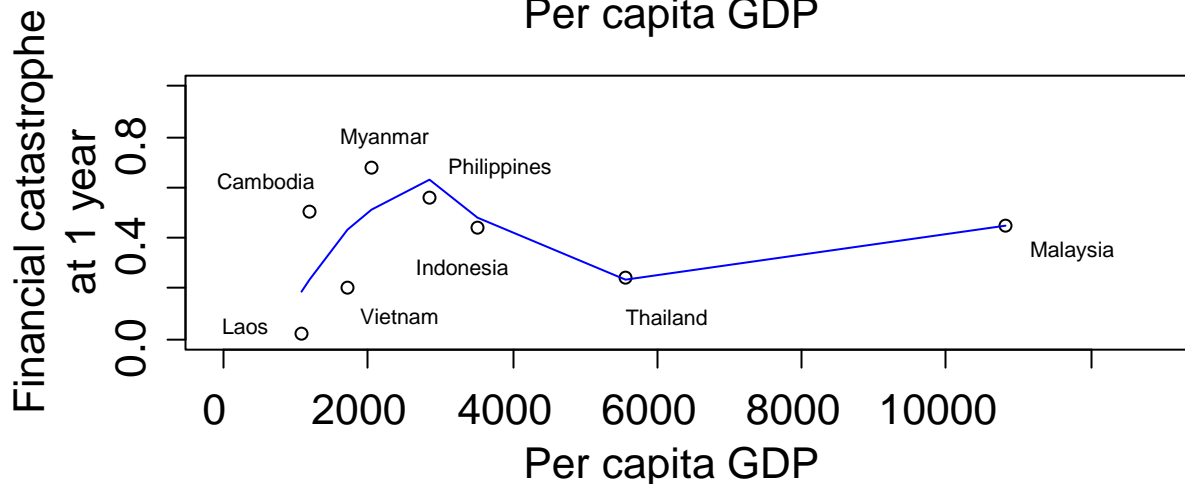
(1) Turkey, 2006.



# A different look... of ACTION data



Threshold ?

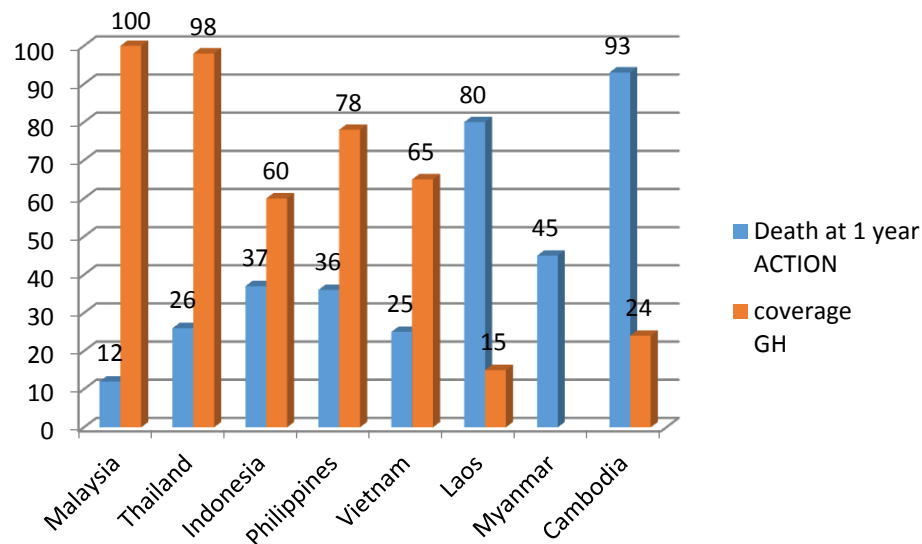


No obvious threshold => room for investigation

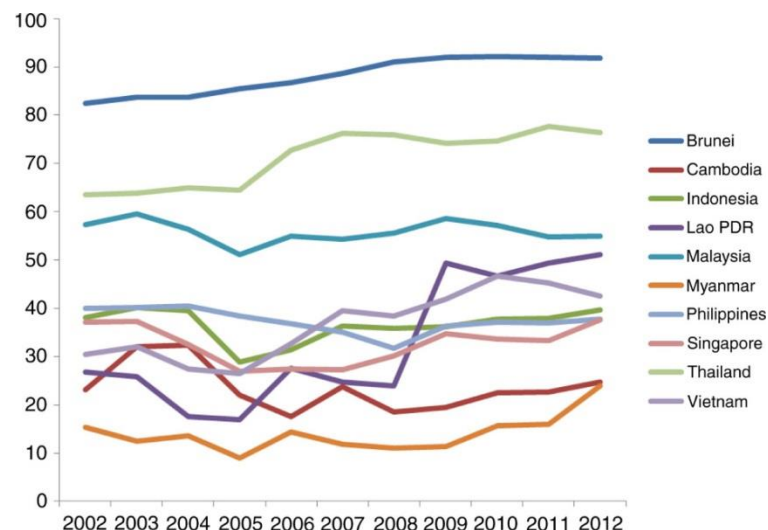
What are the health insurance systems in the countries ? What is the accessibility to health ?

# Health coverage in ASEAN

Coverage of health insurance in ASEAN countries 2012.



Trends in general government expenditure on health as % of total expenditure on health, 2002–2012.



Glob Health Action 2014, 7: 25856 - <http://dx.doi.org/10.3402/gha.v7.25856>

# Strengths of the study

- Huge number of patients but 28% lost-to-follow-up
- Consecutive patients with a first time diagnosis of cancer from 47 hospitals (general and specialist, public and private) within ASEAN, except Brunei Darussalam and Singapore.
- Pragmatic :
  - Impact: economic hardship (33%), Could not pay for medicines/ drugs (45%),...
  - The mechanisms to cope: Ask for financial assistance from government (26%), family (65%), personal loan (28%), savings set aside for other use (60%),...

Inclusion biases ? Selection of centers – which cancer sites ?

Are the impact and the mechanisms identical in all countries ?

# Did cancer push families into poverty in South East Asian settings?

Patients who were not impoverished\* at baseline with complete outcome data, N=4936

Followed-up for 12 months

Not  
impoverished  
n=3299  
(67%)

Impoverished  
n=242  
(5%)

??? because a financial catastrophe that was experienced by close to 50% of patients from most countries

<= why ?

- Malaysia – 0%
- Thailand, Indonesia, Myanmar – 4%
- Vietnam – 8%
- Philippines – 16%

# Effect of health shocks on household out-of-pocket health spending and impoverishment in low and middle income countries

TE = total household expenditure., CTP = 'capacity to pay'.  
nFE = non-food expenditure.  
\*National poverty line.  
†Subsistence poverty line.  
|| International poverty line of US\$1.08 per day per person.  
‡International poverty line of US\$2.15 per day per person.

Study	Country	Out-of-pocket health expenditure (%)	Poverty incidence (%)
Xu et al. 2003	59 countries	0-10.45 (40% of CTP)	-
Xu et al. 2007	89 countries	0-10.00 (40% of CTP)	-
Saksena et al. 2010 [	51 countries	0.62-29.96 (40% of CTP)	-
Wagstaff & van Doorslaer, 2003	Vietnam	5.13 (40% of CTP)	3.40%†
		14.20 (10% of TE)	0.50%‡
Van Minh et al. 2012	Vietnam	4.60 (of TE)	2.50%†
		3.90 (40% of CTP)	
Garg & Karan, 2009	India	4.80 (of TE)	3.24%‡
		10.70 (of nFE)	
Joe & Mishra, 2009	India	6.10 (of TE)	4.40%‡
		12.00 (of nFE)	
Bonu et al. 2007	India	13.10 (10% of TE)	3.50%‡
		5.10 (40% of nFE)	
Gosh, 2011 [17]	India	5.51 (of TE)	4.40%‡
		15.37 (10% of TE)	
Arsenijevic et al. 2013 [18]	Serbia	5.00 (10% > up to	1.10%†
		20% of TE)	
Ico, RD. 2008 [19]	Philippines	3.50 (10% of TE)	14.00%†
		3.80 (10% of CTP)	
Cavagnero et al. 2006 [20]	Argentina	5.50 (40% of CTP)	1.70%†
Tomini & Packard, 2011 [21]	Albania	13.30 (of TE)	3.61%†
	5 Western Balkan		
Mendola et al. 2007 [22]	countries	1.14- 26.32 (10% of TE)	0.05-2.80%±
van Doorslaer et al. 2006 [10]	11 Asian countries	1.37-5.49 (of TE)	0.10-3.80%
			0.30-3.60%±
Flores et al. 2008 [23]	India	29.20-34.15 (10% of TE)	7.24-7.91%‡
Su et al. 2006 [24]	Burkina Faso	8.66 (40% of nFE)	-
Gotsadze et al. 2009 [7]	Georgia	11.70 (40% of CTP)	-
O'Donnell et al. 2005 [25]	6 Asian countries	2.98-15.57 (10% of TE)	-
van Doorslaer et al. 2007 [26]	14 Asian countries	2.01-15.57 (10% of TE)	-
		0.21-7.13 (40% of nFE)	

# Coping strategies

Alam, K., & Mahal, A. (2014). Economic impacts of health shocks on households in low and middle income countries: a review of the literature. *Globalization and Health*, 10, 21. <http://doi.org/10.1186/1744-8603-10-21>

Study	Country	Coping strategies
<a href="#">Phung Duc &amp; Waibe, 2009</a>	Vietnam	11%-13%*** higher number of income sources used
<a href="#">Kruk et al.2009</a>	40 LMICs	***African households 87% and Southeast Asian households 61% more likely (compare to European households) to borrow or sell assets to finance health expenditure
<a href="#">Gertler et al. 2009</a>	Indonesia	***Smaller effects on consumption for households within 1 km of financial institution compared to within 10 km or more
<a href="#">Islam &amp; Maitra, 2012</a>	Bangladesh	**Access to microcredit helps to insure consumption
<a href="#">Powell-Jackson &amp; Hoque, 2012]</a>	Bangladesh	*** US\$17 borrow per month, **US\$4 asset sale and ***US\$4.4 transfer per month compared to normal delivery to fully smooth consumption
<a href="#">Dercon &amp; Krishnan, 2000</a>	Ethiopia	Household with more land are able to insure consumption
<a href="#">Asfaw &amp; Braun, 2004]</a>	Ethiopia	Able to protect food consumption using own production and gifts
<a href="#">Park, 2006 [</a>	Bangladesh	**Relationship between neighbours and relatives helps in pooling risks to smooth food consumption
<a href="#">Sparrow et al. 2012</a>	Indonesia	15%*** used borrowing; 9%*** used selling assets; 22%*** used family assistance; 9%*** reduced consumption
<a href="#">Abegunde &amp; Stanciole, 2008</a>	Russia	7%*** increase in transfer income (gifts) per increase in household number of chronic diseases
<a href="#">Nguyen et al. 2012</a>	Vietnam	Odds ratio = 18** (using loans); Odds ratio = 44* (reducing food consumption)
<a href="#">Raccanelloet al. 2007</a>	Mexico	(+) households used pawning to finance OOP health expenditure**
<a href="#">Modena and Gilbert, 2011</a>	Indonesia	(+) taking loans***; (+) selling assets***; (+) using family assistance***
<a href="#">Debebe et al</a>	Ethiopia	(+) 15%*** borrowed; (+) 17%*** used savings; (+) 17%*** sold assets;
<a href="#">Dhanaraj, 2014</a>	India (Andhra Pradesh)	(+) 49%*** labour supply; (-) 93% *** consumption; (+) 53% borrowed or sold assets; (+) 54% received help
<a href="#">Alam &amp; Mahal, 2014</a>	4 South Asian countries	(+) 6-10%** households borrowed or sold assets to finance OOP health expenditure

# Patient distribution by income status

		Household income, n (%)		
		Low	Medium	High
No of patients		3318	1786	3047
Cancer TNM stage	I	144 (8)	113 (12)	235 (13)
	II	491 (28)	298 (32)	587 (33)
	III	666 (38)	284 (31)	514 (29)
	IV	442 (25)	236 (25)	431 (24)
	Hematological	322	182	189
Health insurance	None	1873 (56)	1053 (59)	1594 (52)
	From government	1079 (33)	405 (23)	870 (28)
	From employer	188 (6)	141 (8)	208 (7)
	Private	177 (5)	187 (10)	372 (12)
Surgery	No	1807 (56)	910 (51)	1403 (46)
	Yes	1421 (44)	857 (49)	1615 (54)

P<.001  
Time to  
get access  
is longer ?

P<.001

Access to  
surgery ?  
Bias ?

P<.001

# Extent to which health insurance, cancer stage, and treatment explained financial catastrophe and death

	Multinomial logistic regression model for odds of financial catastrophe, and death relative to no financial catastrophe adjusted for:	AIC*	Difference in AIC between models
BASE	Age, sex, country, baseline household income status	11523	-
STEP 1	Age, sex, country, baseline household income status,	11521	0
	and <b>health insurance</b> (yes, no)	Probability that step 1 is better than step 3 : 0%	
STEP 2	Age, sex, country, baseline household income status,	8371	27
	health insurance, and <b>cancer stage</b> (TNM I, II, III, IV,		
	hematologic cancers)	Probability that step 2 is better than step 3 : 0%	
STEP 3	Age, sex, country, baseline household income status,	7200	14
	health insurance, cancer stage, and <b>treatment</b> (surgery		
	[no], planned chemotherapy [yes,no], planned		
	radiotherapy [yes/no], planned hormone therapy [yes,		
	no], other treatment [yes,no])		

Akaike weights ( $w_i$ ) provide another measure of the strength of evidence for each model, and represent the ratio of delta AIC ( $\Delta_i$ ) values for each model relative to the whole set of  $R$  candidate models:

$$\text{Akaike weight} = w_i = \frac{\exp(-\Delta_i/2)}{\sum_{r=1}^R \exp(-\Delta_r/2)}$$

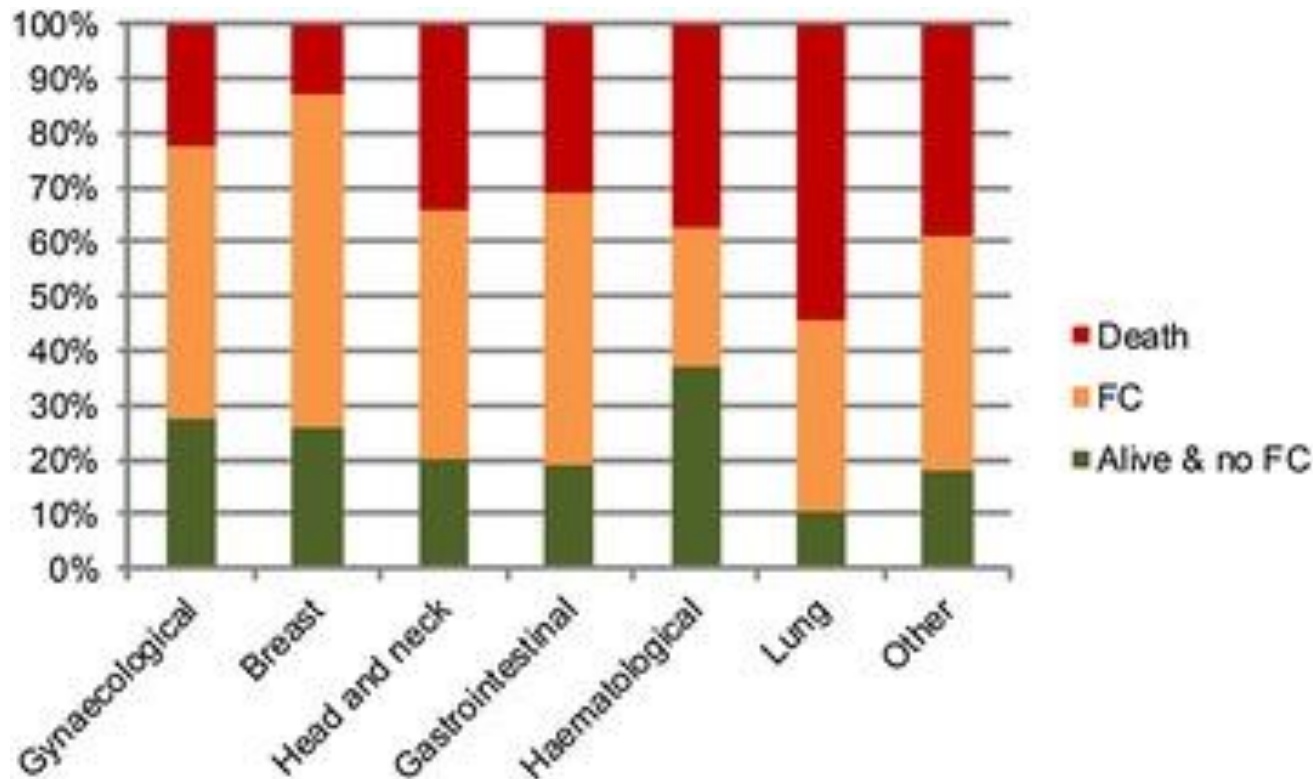
12

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	radiotherapy [yes/no], planned hormone therapy [yes,		
	no], other treatment [yes,no])		
		Cancer site ?	

- 1) Stage
- 2) Treatment availability
- 3) Treatment affordability

# Competing outcomes of death, financial catastrophe, and alive with no financial catastrophe at 12 months after diagnosis, by location of cancer in the body



In females, cancer site was not associated with FC. In males, cancer in the head and neck region (0.54; 0.36–0.80) and haematological cancers (0.56; 0.42–0.76) were associated with a lower odds of FC compared to digestive cancers (reference group).

# Conclusion

ACTION is **the first study** to use socioeconomic differences, to assess the burden of cancer in South East Asia. It will facilitate evidence-based policy making in every country participating.

1. **Cancer down-staging via early detection** may provide the best avenue to favorably influence economic and disease outcomes in cancer patients in low- and middle-income ASEAN countries.
2. Apart from early detection, providing **access to prompt administration of (affordable ) treatment** for cancer patients may potentially reduce financial loss, and premature deaths.
3. Governments need to **improve financial risk protection** for cancer patients → **re-examination of health financing** systems → public funds channeled to those who need them most

- 1) Stage
- 2) Treatment availability
- 3) Treatment affordability

# Are the conclusions appropriate ?

- YES: the ACTION study is remarkable

The basis for the ASEAN cancer program

- But: do not forget primary prevention !

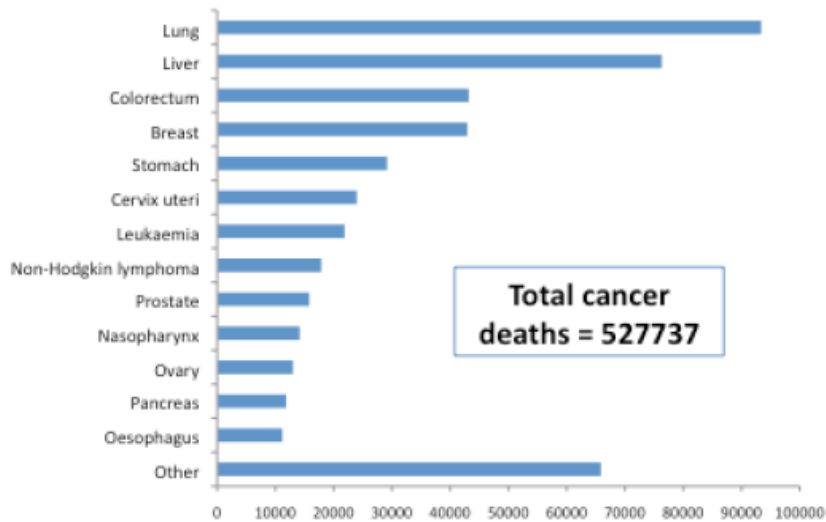


Figure 1. Cancer Incidence in The ASEAN Region, 2012. Source of Data: GLOBOCAN (April 16, 2014)

## Prevention and Early Detection

1. To **increase efforts to reduce tobacco consumption** by implementing national regulations as well as encouraging governments to implement the Framework Convention on Tobacco Control (FCTC).
2. To raise public awareness regarding the need for campaign to reduce culturally sensitive cancer risk factors and promote risk factors reduction strategies at the community level.
3. To implement efforts to reduce exposure to carcinogens.
4. To promote access to adequate and affordable screening and treatment for the detectable cancers and **vaccines to prevent cancer-related infections**.

DOI:<http://dx.doi.org/10.7314/APJCP.2014.15.19.8521>

*A Consensus Plan for Action to Improve Access to Cancer Care in the ASEAN Region*