



# UICC GTF RCC

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Burden of disease amenable to RT

# Demand for RT

- Rates of Incidence
  - Primary data sources
- Demand for radiation
  - Customisation to different countries

All models are wrong but some are useful



George Box

# Estimating the demand for XRT

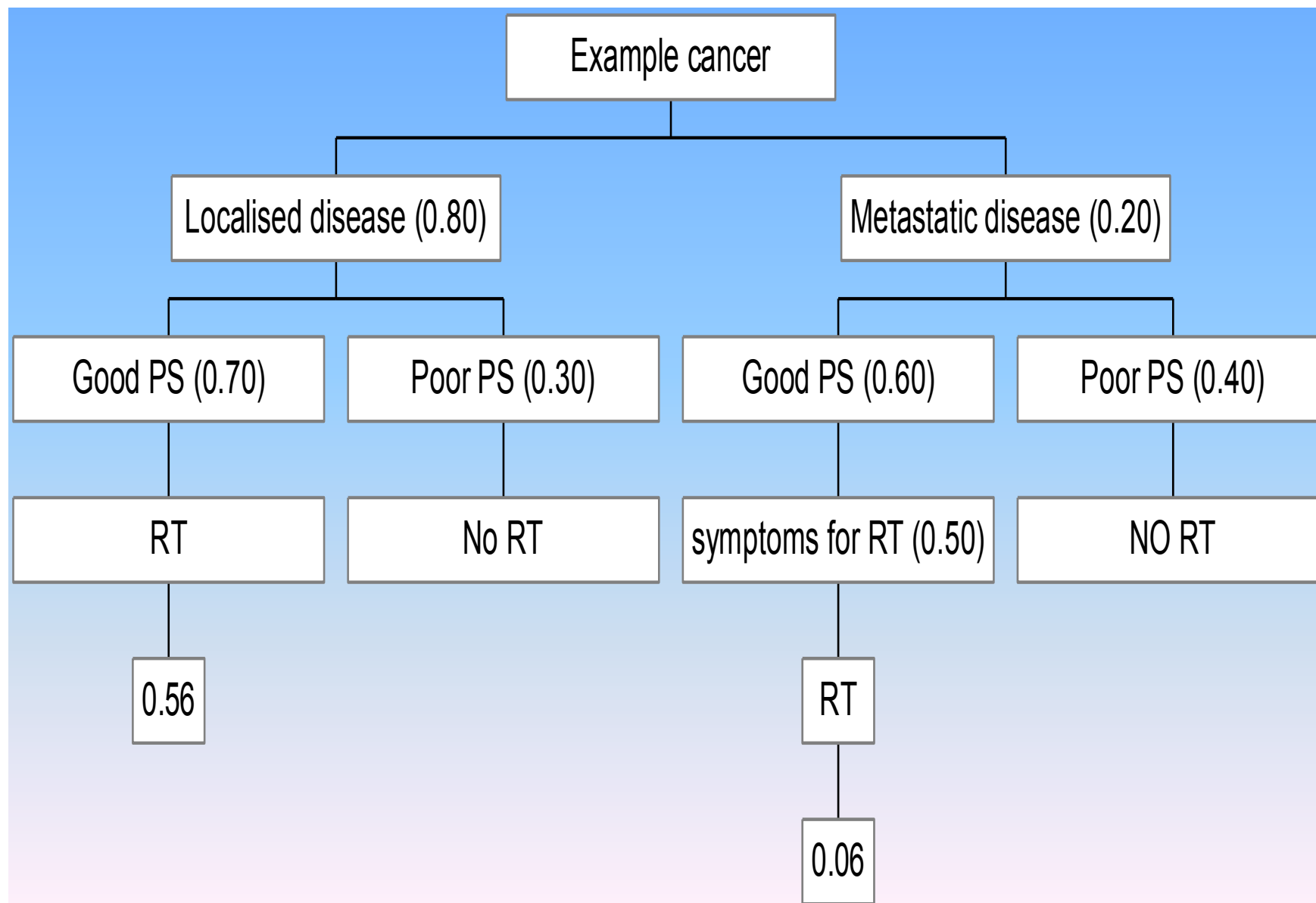
- Ideal proportion of each cancer that *should* receive external beam radiotherapy
  - *at some time during the course of their illness*
- Develop a model of RT utilization
  - evidence-based
  - altered in the future

# Exclusions

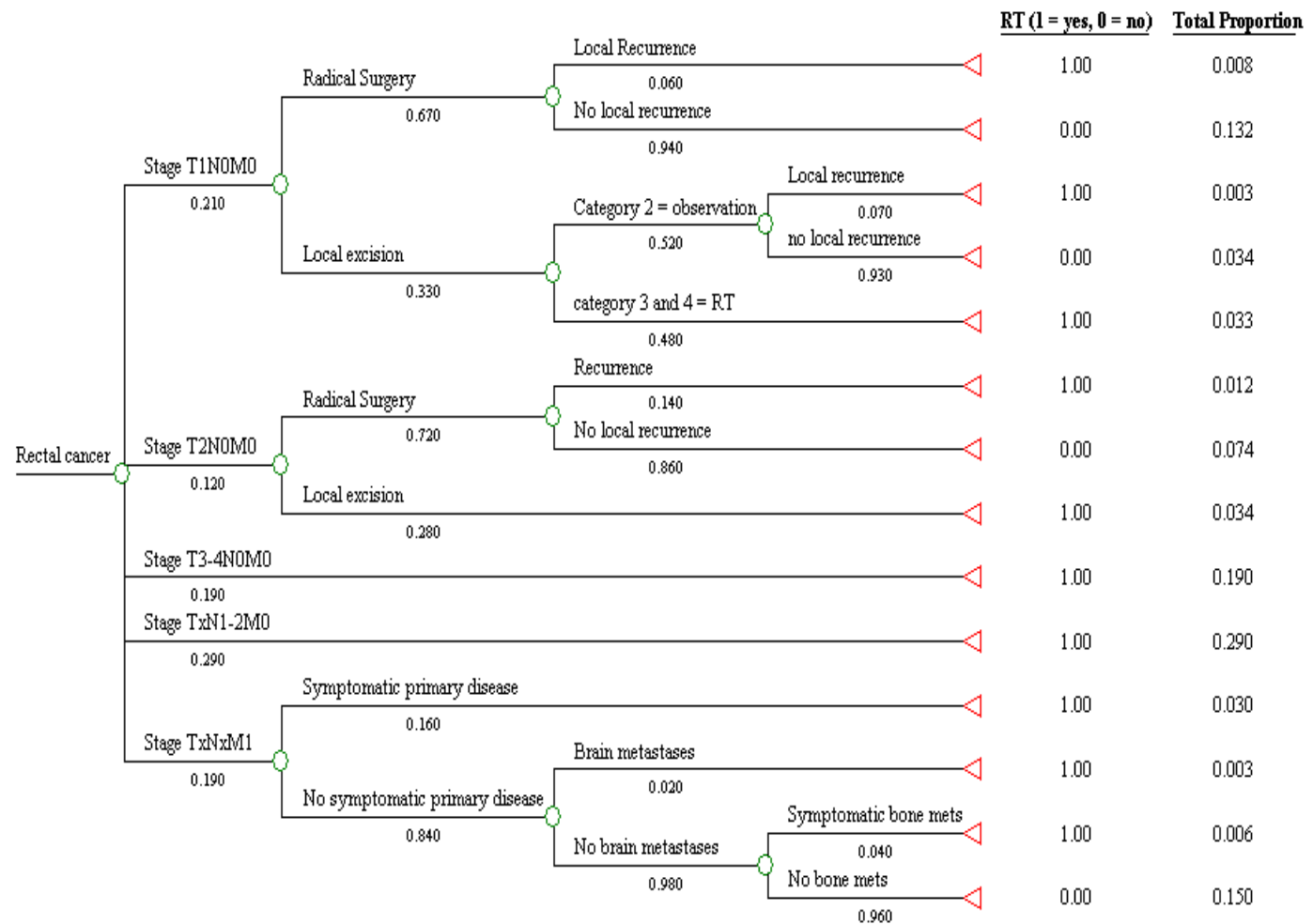
- Non-melanomatous skin cancer
- Benign tumours
- Brachytherapy
- SXR

## Methods

- Identify all cancers with a proportion  $>1\%$
- Literature search for
  - treatment guidelines
  - reviews for each cancer
- Levels of evidence
  - Efficacy
  - Epidemiology
- Optimal Radiotherapy Utilization Tree (TreeAge)
  - indications
  - incidence



# Actual tree – rectal cancer







## RTU 2003

- 1000+ Pieces of evidence examined
- Constructed RTU trees on 23/23 cancers
- Comprises 98% of all cancer by incidence
- **52% of all cancers need RT**

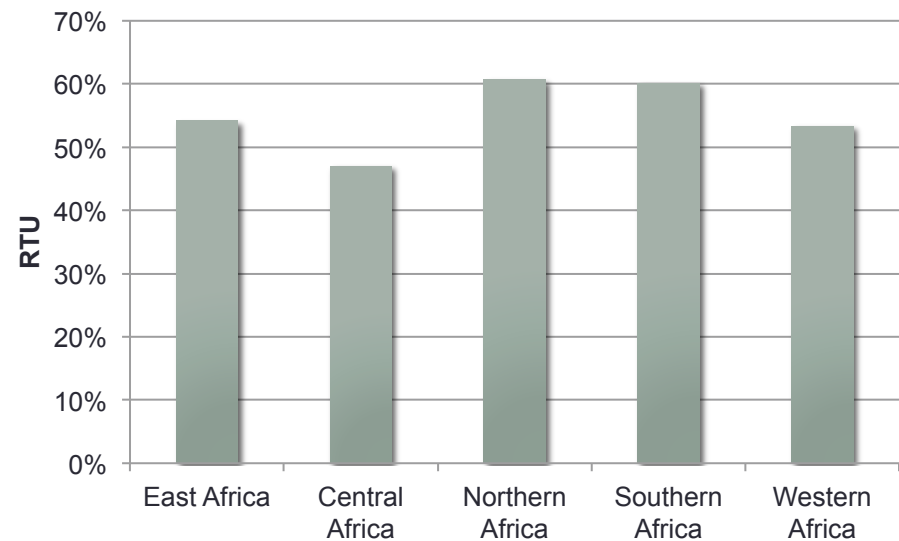
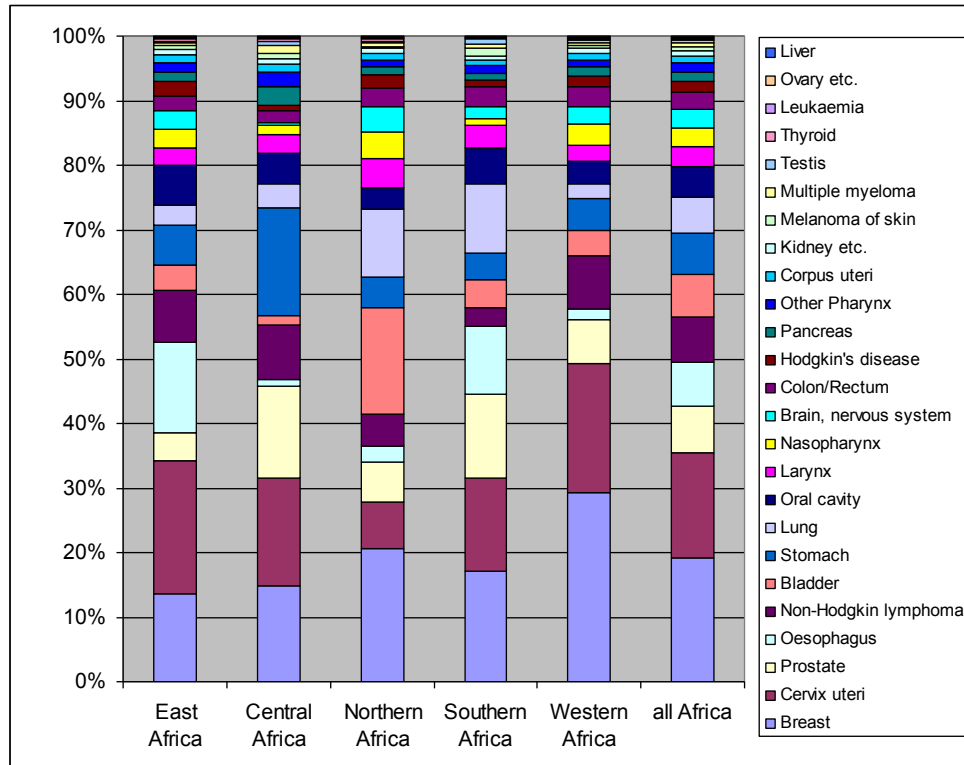
# RTU revision 2012

<http://tinyurl.com/pwkua34>

Site	Old RTU	New RTU	Changed indications
Bladder	58%	47%	0
Brain	92%	80%	Tree changed
Breast	83%	87%	0
Cervix	58%	71%	Tree changed
Colon	14%	4%	-1
Gall bladder	13%	17%	0
Head and Neck	74%	74%	Tree changed
Kidney	28%	15%	-1
Leukaemia	4%	4%	0
Liver	0%	0%	N/A
Lung	76%	77%	0
Lymphoma	65%	73%	4
Melanoma	23%	21%	3
Myeloma	38%	45%	3

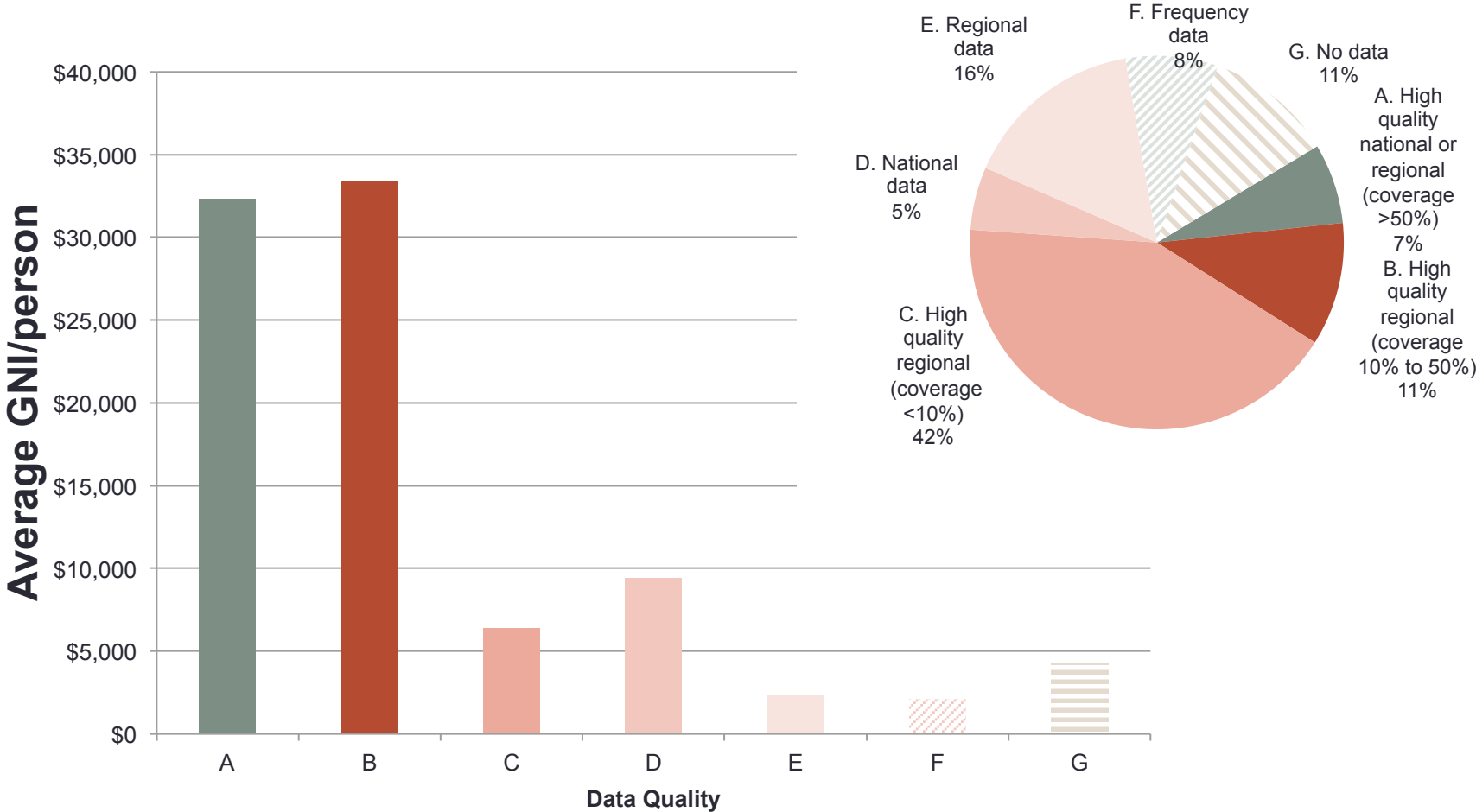
Site	Old RTU	New RTU	Changed indications
Oesophagus	80%	71%	1
Other	50%	19%	Tree changed
Ovary	4%	4%	0
Pancreas	57%	49%	Tree changed
Prostate	60%	58%	Tree changed
Rectum	65%	60%	0
Stomach	68%	27%	1
Testis	49%	7%	Tree changed
Thyroid	10%	4%	Tree changed
Unknown Primary	61%	61%	0
Uterus	46%	38%	Tree changed
Vagina	100%	94%	Tree changed
Vulva	34%	39%	Tree changed
<b>TOTAL</b>	<b>52.3%</b>	<b>48.3%</b>	

# Effect of tumour type distribution

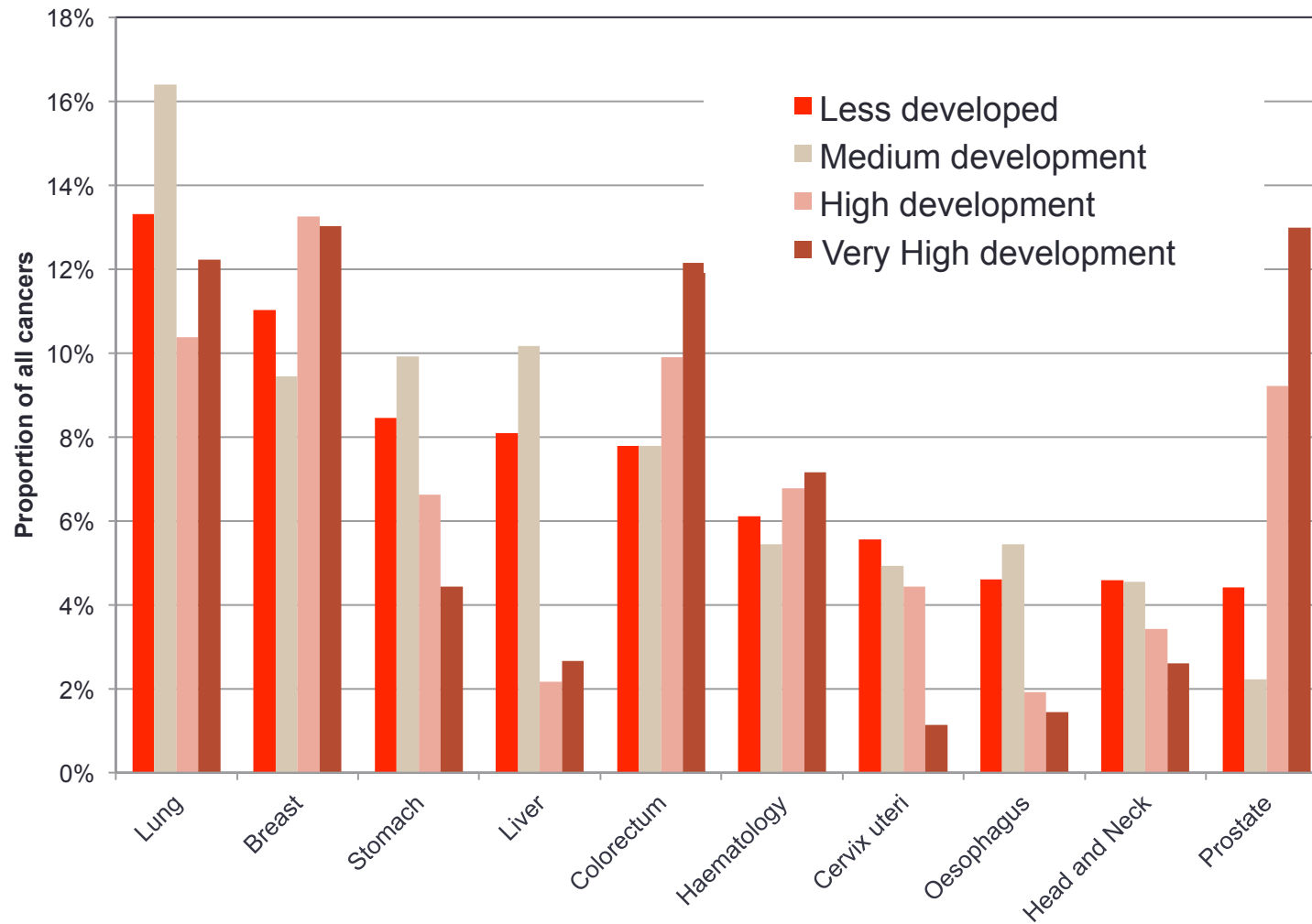


Lancet Oncol. 2006 Jul;7(7):584-95

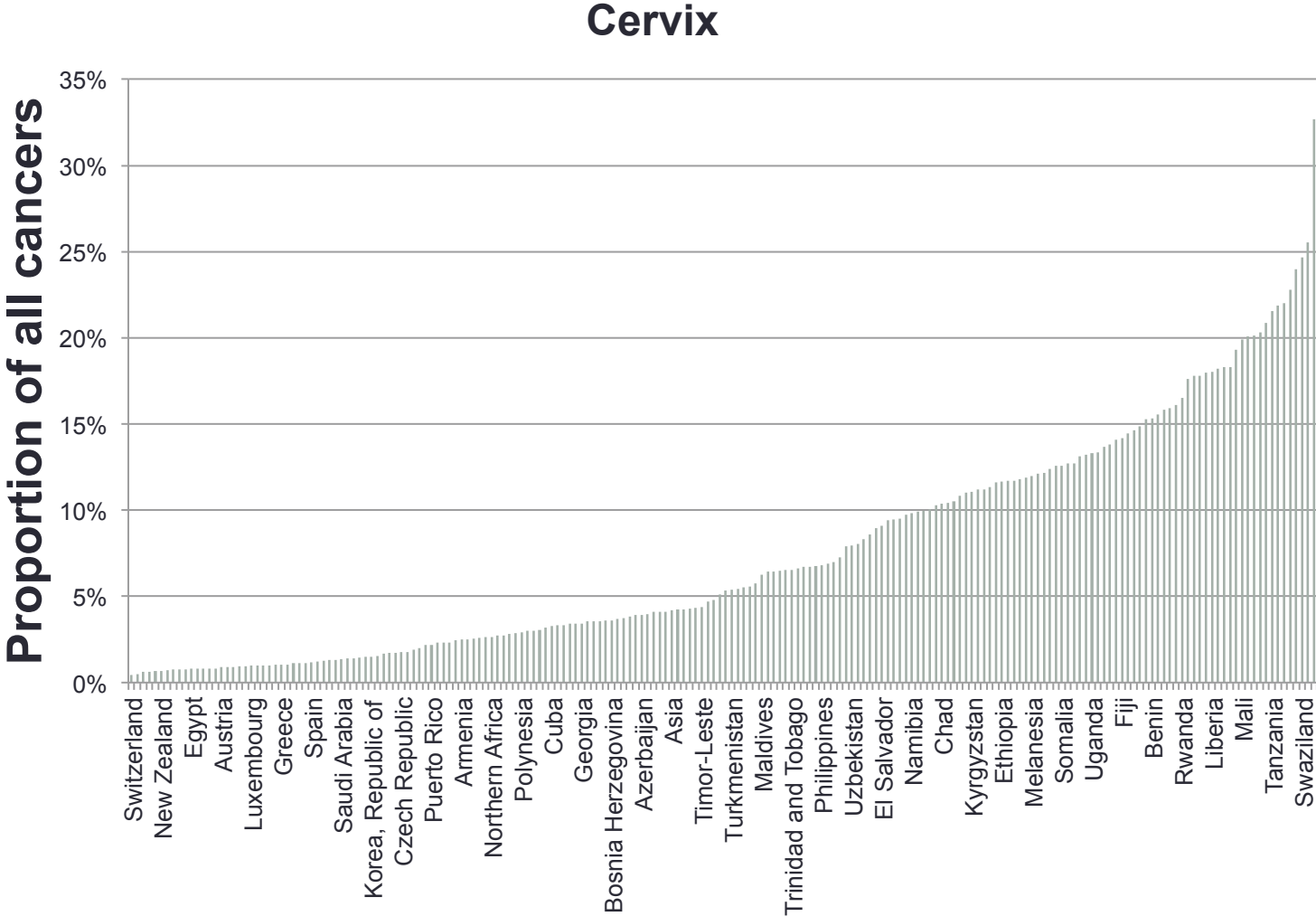
# Data quality and GNI/person



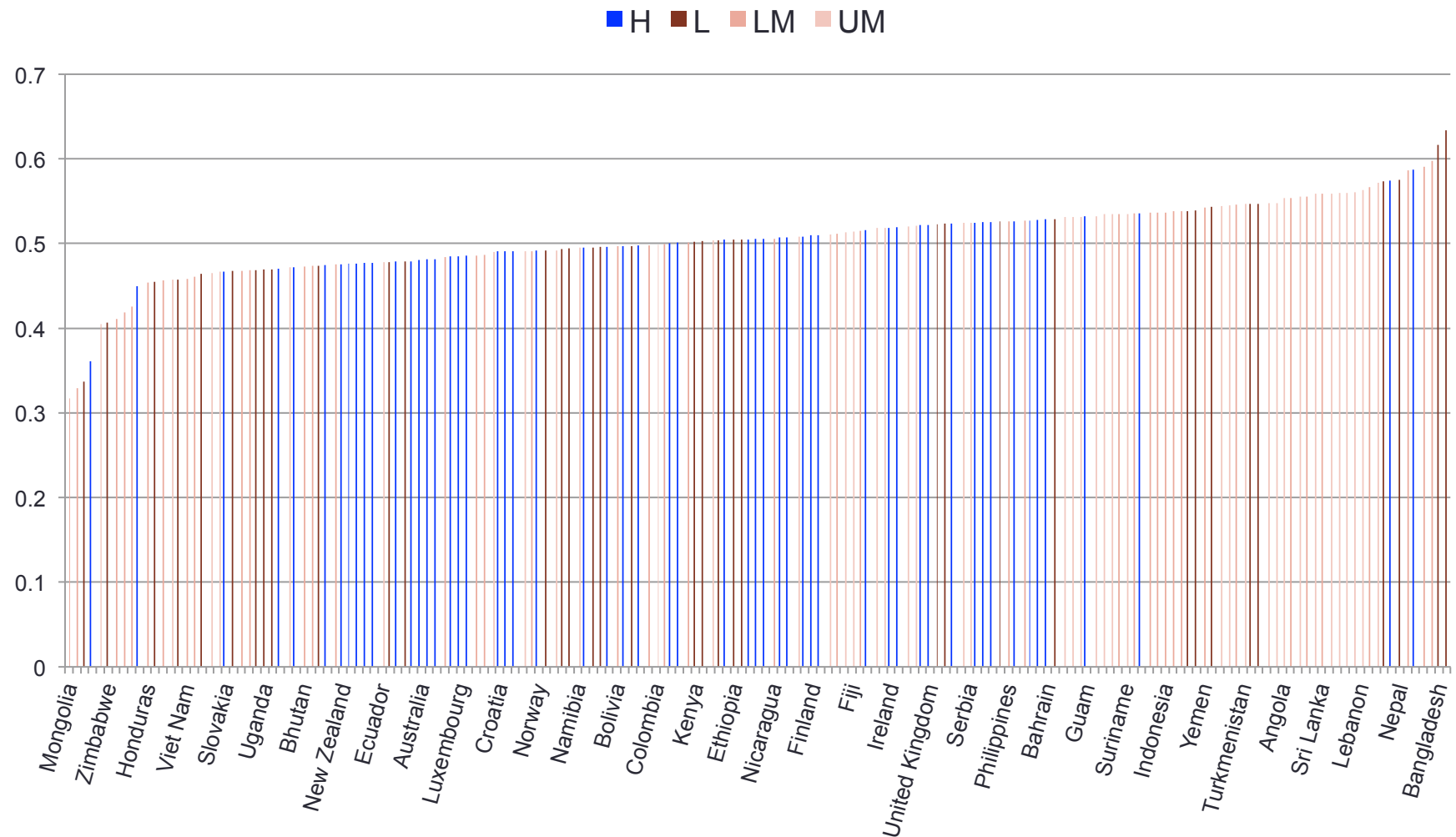
# Top 10 cancers



# Individual country variation



# RTU casemix adjustment only

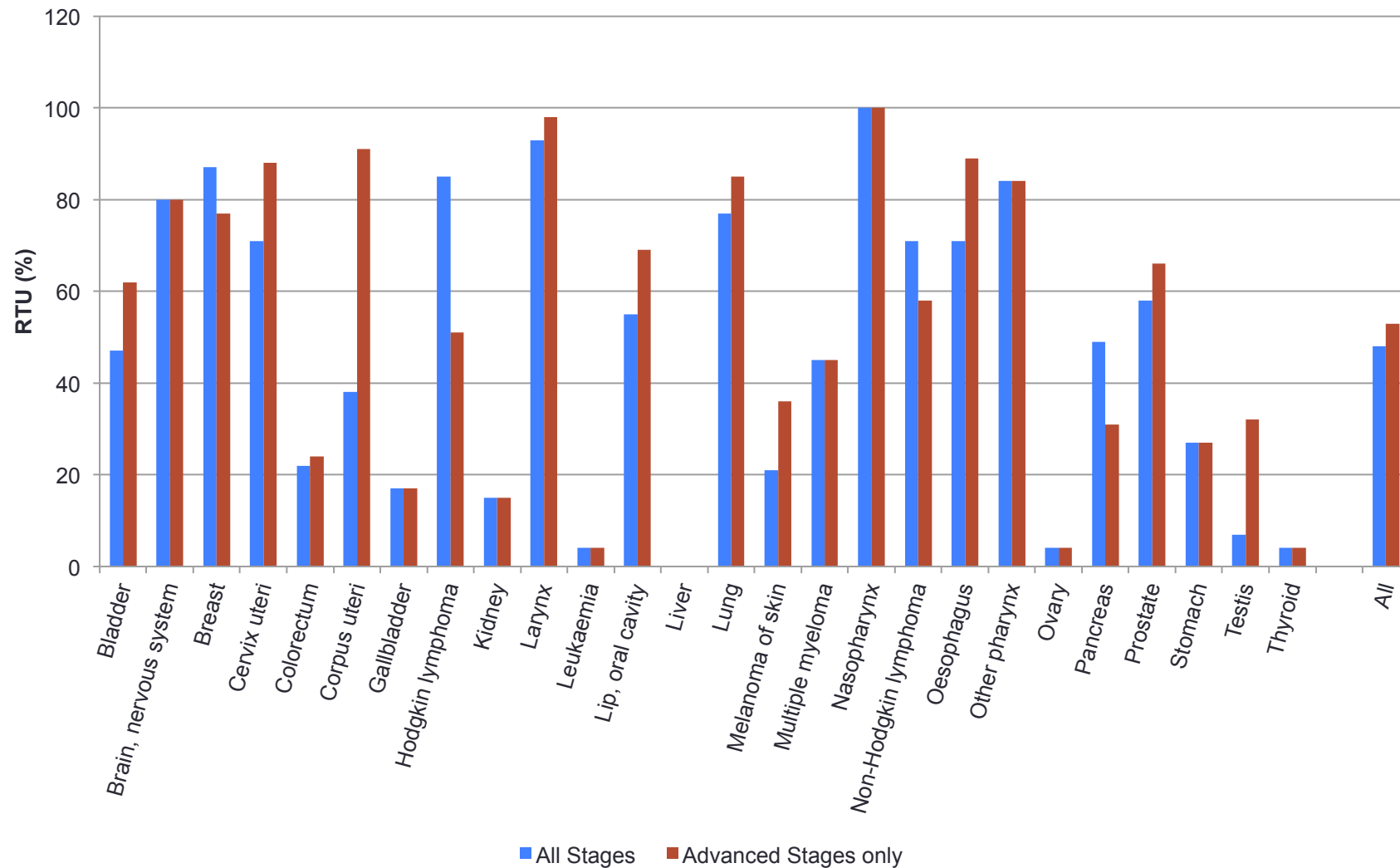




## Stage adjusted for Low Income countries

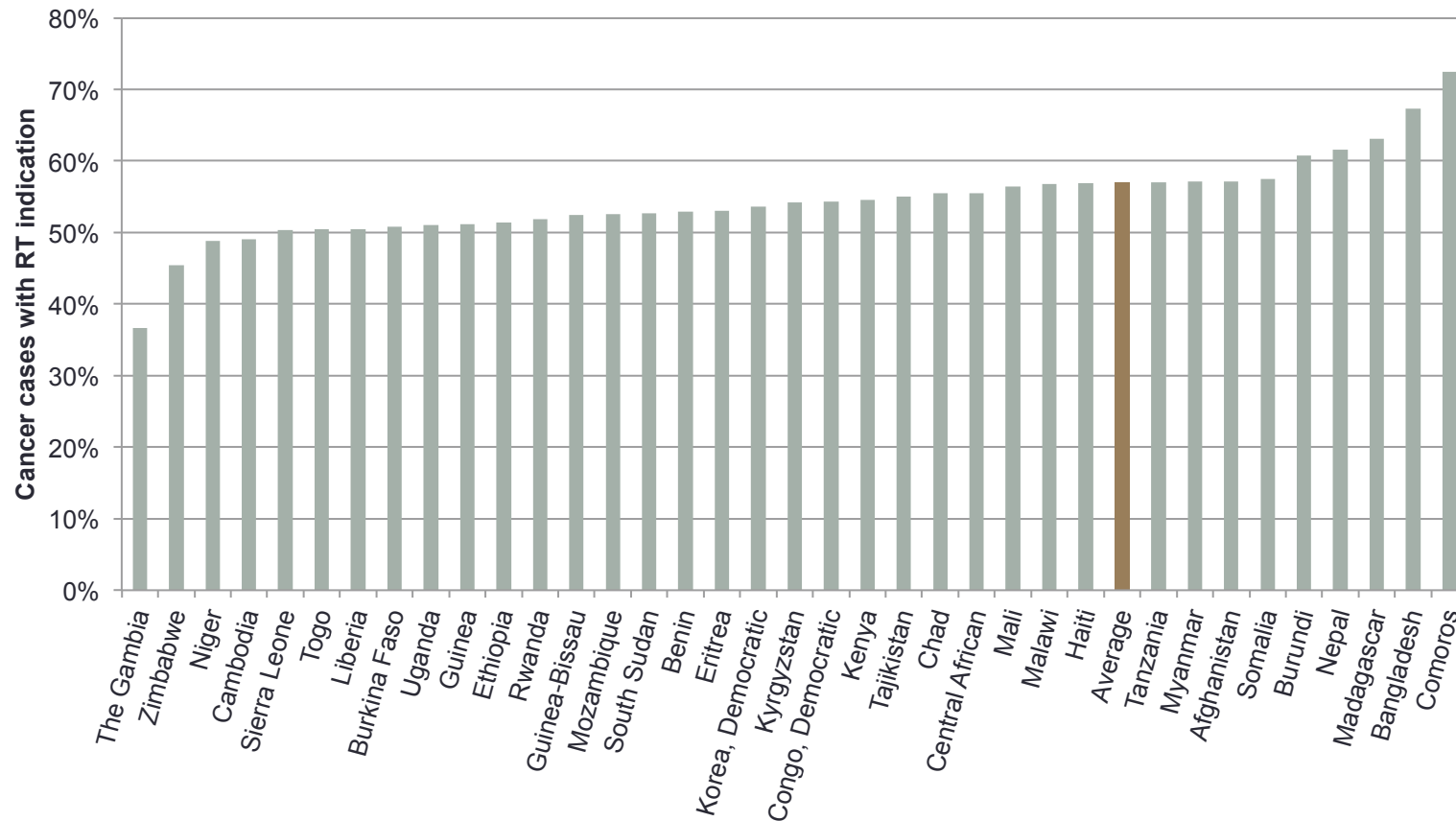
No change	Stage I removed	Stage I/II removed	Other
brain	Bladder	Lymphoma	Cervix IA
Colon	uterus	larynx, oral cavity + lip, other pharynx	Prostate LOW RISK
gall bladder	melanoma	pancreas	Breast T1-2 N0-1
kidney	oesophagus	lung - NSCLC	Rectum T1N0M0
leukaemia	testis		
liver			
Lung - SCLC			
myeloma			
nasopharynx			
ovary			
stomach			
thyroid			

# Stage adjusted RTU

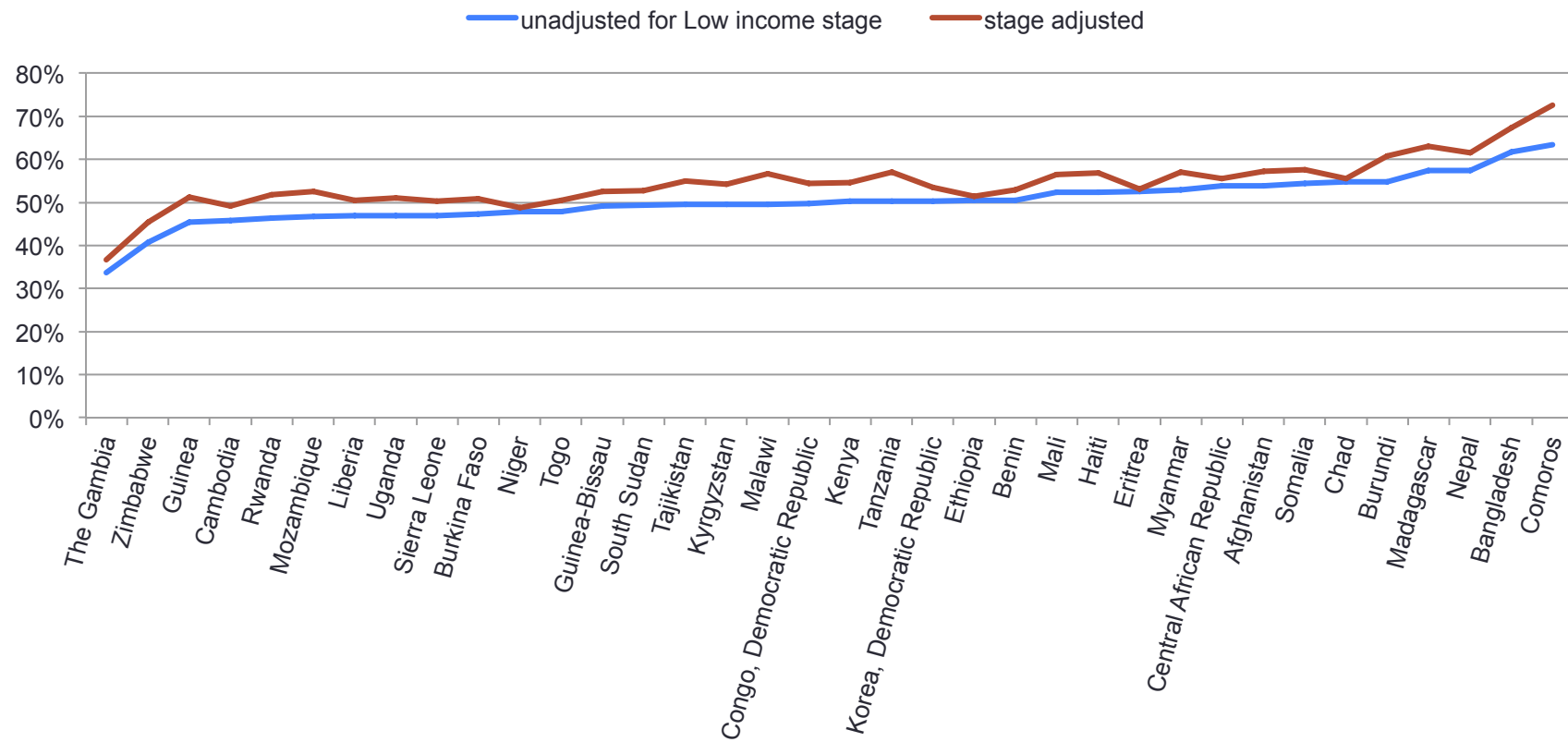


# Stage adjusted demand

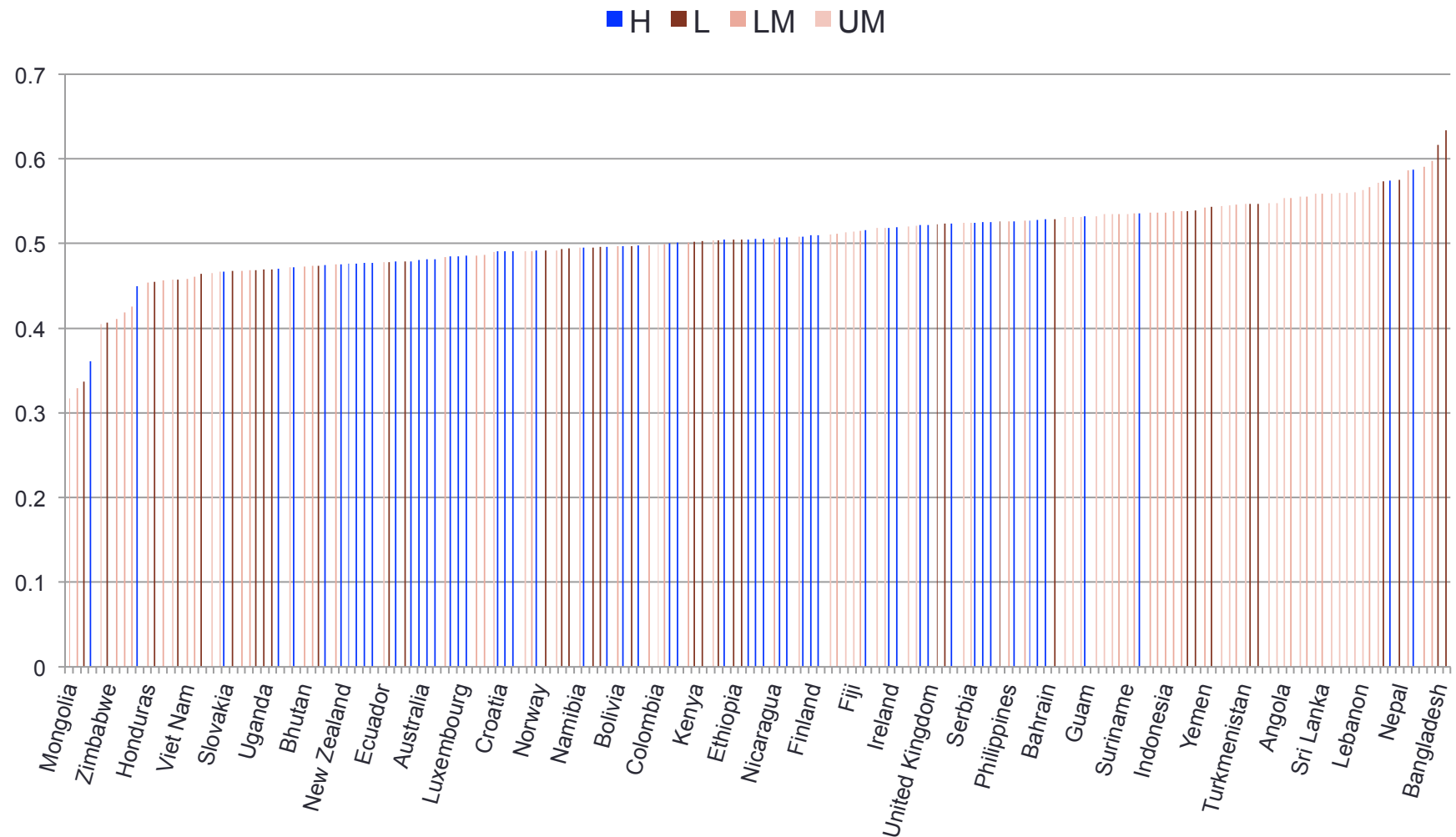
## Low Income countries



# Effect of adjusting for stage



# RTU casemix adjustment only



# Conclusions

- Data source: Globocan 2012
  - Uniform data collection method
  - Quality measure
  - Curated data
- Model: CCORE 2012
  - Adapt to case mix for 184 countries
  - Adapt for low income stage mix
- Still to be done
  - More stage data if available
  - Projections
  - Fractions