Leveling the playing field:

Using evidence to determine 'fair' drug prices

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What are drugs worth?

- How should drugs be valued?
- What should we be prepared to pay?
- Evidence-based pricing

The market for pharmaceuticals is flawed

The industry has chosen to ignore large markets

Lack of true competition

Informational asymmetry

Imbalance of market power - those who most need are least able to afford drugs

Divergence of interests of customers and investors

At prices offered new drugs often offer small marginal gains for large marginal costs (seldom seen in other technology and knowledge-based industries)

Pharmacoeconomics

- Usually relates the net benefits to the net costs, and the price is a given
- cost-effectiveness ratios can be used to generate 'indicative' prices that represent 'value for money' in different communities/contexts
- the application of economic utility theory and consideration of social opportunity cost is consistent with marked variation in prices in different communities/contexts

Pharmacoeconomics

- **The argument that a drug 'does not represent value for money' is different from saying it is 'not affordable'**
  - **The first is a confident statement from a potential customer**
  - **The second an expression of helplessness**

Pharmacoeconomics – an example

Drug X saves 1 life for every 10 treated

Each survivor lives 10 years

Drug X costs $2000 (in Australia)

It costs 10*$2000 to gain 10 life years, so the cost/LYG is $2000

Does Drug X offer 'value for money' in Australia?

The same drug in another country

Drug X saves 1 life for every 10 treated

Each survivor lives 10 years

For every 10 persons treated we gain 10 life years (LYG)

Assume an 'acceptable' cost-effectiveness ratio in country 2 is $200/LYG

Then the indicative 'value for money' price in that country is $200

What does 'value for money' mean in country 2?

The 'acceptable' ratio in country 2 is $200/LYG v $2000/LYG in Australia

The opportunity cost of $2000 is too high in country 2

Committing $200/LYG in country 2 is a good investment compared with other life-saving interventions

A case study using ACE-inhibitors

Basic assumptions underlying the analysis:

Set 'value' of LYG as equivalent to a proportion of per capita GNP (A proxy measure of value) *not* a judgment of intrinsic worth

Estimates of benefit of ACE-Is

Derived from systematic (Cochrane) reviews

In treatment of hypertension

- *no evidence of benefit* over diuretics / β-blockers

In congestive heart failure

- clear benefit over placebo

In patients with left ventricular dysfunction after heart attack

- clear benefit over placebo

Magnitude of the benefit

Mortality

Indication	ACE-Inhibitor	Comparator	Risk difference
hypertension			0%
CHF	35.18%	39.72%	4.54%
post-MI	20.45%	24.64%	4.19%

Lives and life years gained per 1,000 patients

Indication	Lives saved	Years of follow-up	Life years gained
hypertension	0	3.5	0
CHF	45.4	3.5	80
post-MI	41.9	3.5	74

Other assumptions in the model

Use of ACE-s is 90% for hypertension, 8% for CHF, 2% for post-MI (base case)

Treatment of hypertension requires one DDD, of CHF 2DDDs, post-MI 3DDDs

Method

From

estimates of LYGs derived from the meta-analyses, combined with . . .

value of LYG, set to a proportion of per capita GNP . . .

calculate an implied incremental cost-effectiveness ratio, and from this . . .

an indicative price (the price which would have resulted in this ICER)

Results

Base case: 90% hypertension, 8% CCF, 2% post-MI

Country	GNP per capita	Weight LYG	Incr.cost/1000pt/3.5 yrs	Target Mthly Price
Armenia	$500	7.83	3,670	$0.20
Australia	$20,511	7.83	150,547	$8.07
Banglad	$359	7.83	2,633	$0.14
Belgium	$24,088	7.83	176,808	$9.47
Brazil	$4,541	7.83	33,329	$1.79
Canada	$20,000	7.83	146,800	$7.87
China	$826	7.83	6,063	$0.32
India	$461	7.83	3,383	$0.18
RSA	$3,112	7.83	22,839	$1.22
USA	$31,880	7.83	233,998	$12.54

Results (2) 80% HT, 15% CHF, 5% post MI

Country	Target Mthly Price (1)	Target Mthly Price (2)
Armenia	$0.20	$0.27
Australia	$8.07	$11.00
Bangladesh	$0.14	$0.19
Belgium	$9.47	$12.92
Brazil	$1.79	$2.44
Canada	$7.87	$10.73
China	$0.32	$0.44
India	$0.18	$0.25
RSA	$1.22	$1.67
USA	$12.54	$17.10

Limitations of the methodology

Per capita GNP as proxy measure of affordability is arbitrary (and probably not linear)

Method dependent on the quality/applicability of evidence

Any effect modifiers should be included

The present example takes no account of cost offsets

Must be supported by underlying data collection systems to inform the context

Advantages of the methodology

Places PE in context

Establishes nexus between price, value and
evidence of benefit

Price *not* derived from cost of R&D or
production

Can be used in price/volume agreements

EBM foundation is empowering

Sources of evidence

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