Applying Health Economics in the Policy World

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Francis Dickinson

Clinical Quality & Efficiency Analytical Team

NHS Medical Directorate

NB. This presentation reflects the personal view of the author and not necessarily the view of the DH.

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Outline

- To sketch out policy questions in cancer:
  - Cost of cancer
  - Earlier Diagnosis
  - Transforming Inpatient Care
  - Chemotherapy – alternative settings
  - Proton Beam Therapy
  - Survivorship baseline data
  - End of Life care
- Impact Assessment for the Cancer Strategy
- Future Issues

Cost of Cancer

Programme Budgeting estimated England level gross expenditure for all programmes and subcategories for all years collected.

Prog. Budget	Programme Budgeting Category	Gross Expenditure (£billion)						
		2003/04	*2004/05*	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*
2	**Cancers & Tumours (C & Ts)**	**3.39**	**3.77**	**4.30**	**4.35**	**4.96**	**5.13**	**5.86**
2A	C & Ts - Head and Neck	-	-	-	0.15	0.14	0.14	0.17
2B	C & Ts - Upper GI	-	-	-	0.21	0.23	0.24	0.28
2C	C & Ts - Lower GI	-	-	-	0.33	0.34	0.37	0.41
2D	C & Ts - Lung	-	-	-	0.20	0.23	0.24	0.28
2E	C & Ts - Skin	-	-	-	0.10	0.11	0.10	0.11
2F	C & Ts - Breast	-	-	-	0.40	0.45	0.50	0.57
2G	C & Ts - Gynaecological	-	-	-	0.16	0.16	0.16	0.18
2H	C & Ts - Urological	-	-	-	0.41	0.43	0.44	0.46
2I	C & Ts - Haematological	-	-	-	0.47	0.55	0.56	0.65
2X	C & Ts - Other	-	-	-	1.93	2.32	2.39	2.75

Earlier Diagnosis

Key policy question: “What is the likely impact of earlier diagnosis of cancer, in terms of costs and outcomes”.

- How would the costs to the NHS change if certain cancers were detected and diagnosed appreciably earlier?
- How would the benefits to individuals change if certain cancers were detected and diagnosed appreciably earlier?
- Five cancers: breast, colo-rectal, lung, prostate and skin (melanoma)
- Key feature of these models was that all inputs, activity and outcomes were **modelled by stage at diagnosis**.

Results

- Earlier diagnosis is generally cost-effective, but not cost-saving
- Main benefit is a substantial improvement in health outcomes
- There is not a cost reduction, rather an increase in NHS costs (large increase in testing costs generally offset by a modest reduction in treatment costs).
- Data and modelling limitations.

Transforming Inpatient Care

Aim is to improve quality of care for patients, and find efficiency gains

Sharing of good practice

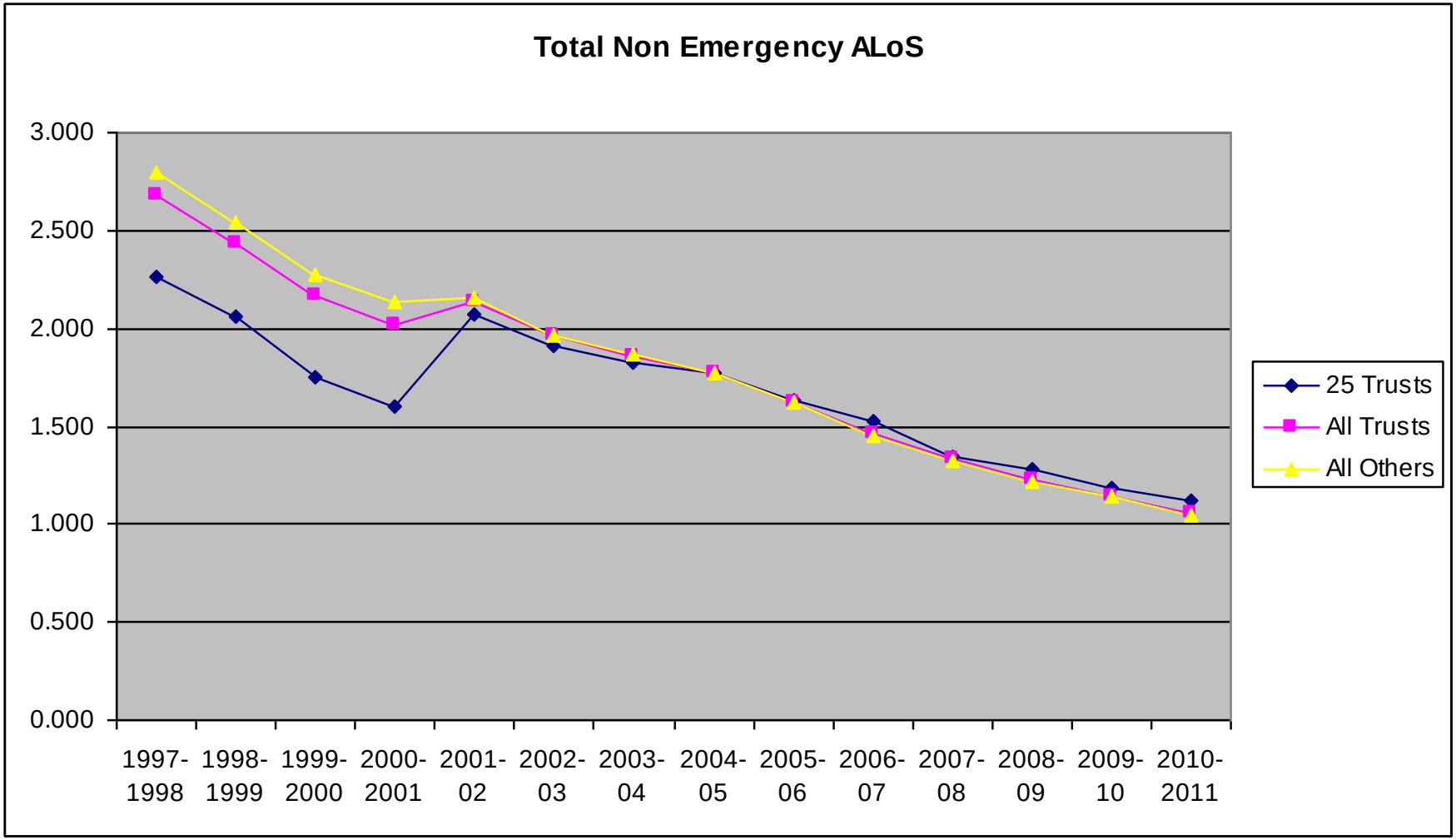
Our Task: Estimate potential reduction in bed days

Possible approaches:

- Compare the test Trusts with the Rest of the NHS and generalise from the test Trust improvements
- Analyse variation in the NHS and assume that all Trusts can achieve the length of stay of the top quartile.

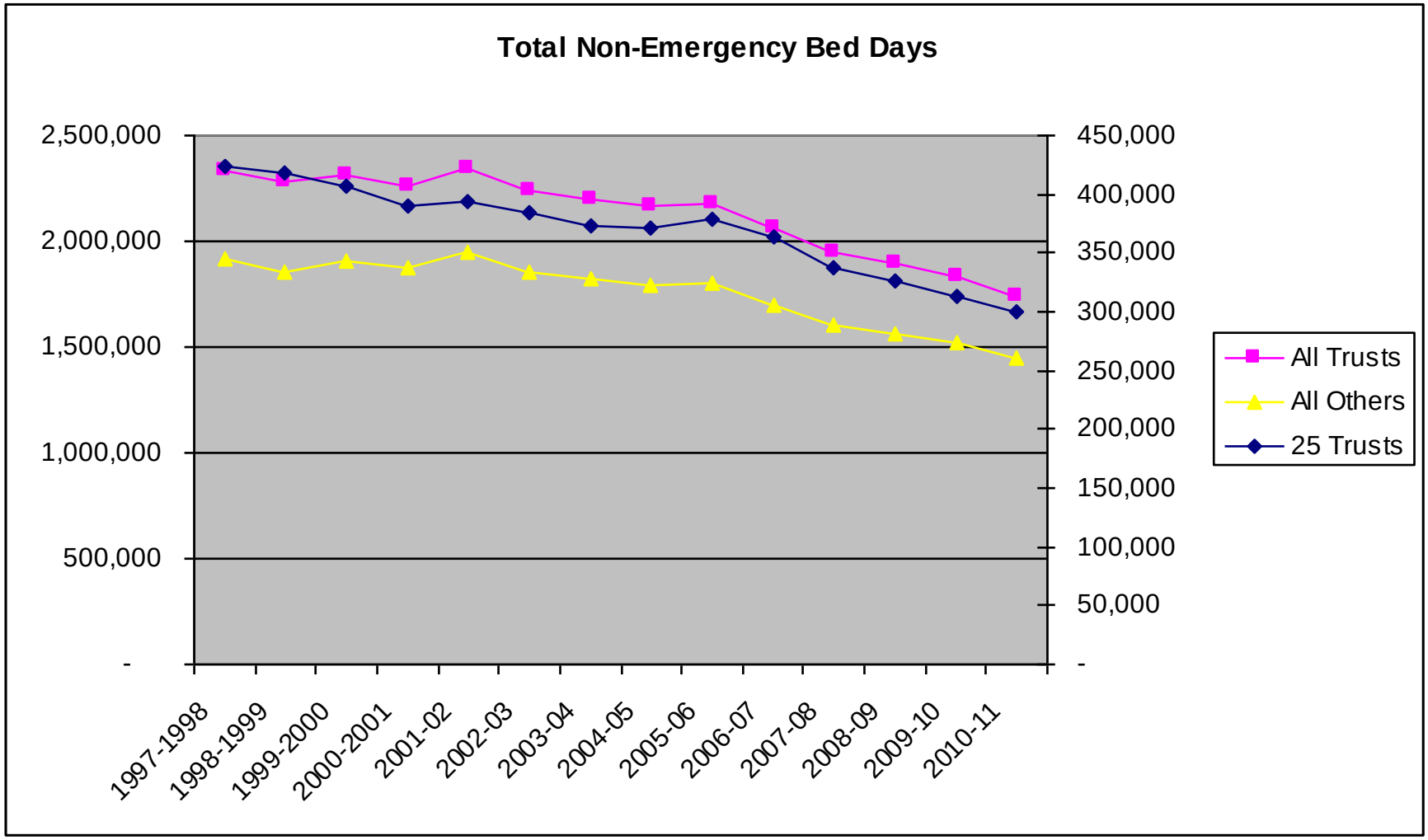
Transforming Inpatient Care

All Cancers Non-Emergency Average Length of Stay



Transforming Inpatient Care

All Cancers Non-Emergency Bed Days



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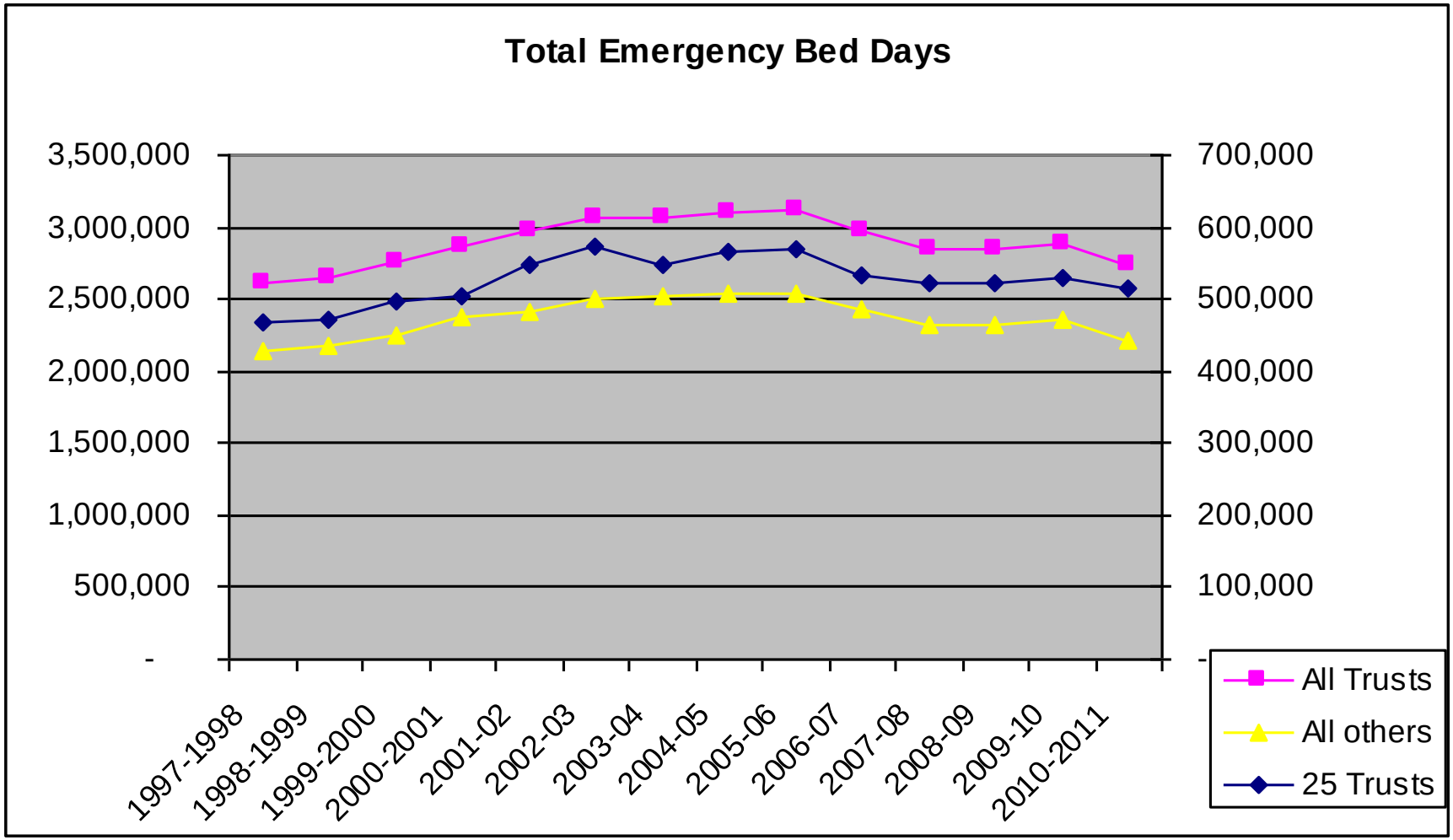
Transforming Inpatient Care

All Cancers Emergency Bed Days



Transforming Inpatient Care
Breast Surgery

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Trends over 2006/07 to 2010/11 (provisional)

- Number of procedures for relevant breast surgery from 52,371 to 54,795.
- Day case procedures 13,255 to 18,988, an increase of 43%.
- Procedures with a length of stay of zero or one day has increased from 11,457 to 20,387, an increase of 78%.
- Procedures with a longer length of stay have decreased from 27,659 from 15,420, a fall of 44%.
- ALoS for inpatients has fallen from 3.15 to 2.03 days over the same period.
- Total bed-days from 123,038 to 72,709 over this period, a reduction of 41%, despite the slight increase in the total number of procedures.
- The proportion of patients not admitted the day before has increased from 69.6% to 94.6%.
- These improvements do not appear to have had an adverse impact on readmissions, as these have remained constant at 3.1-3.2% of procedures.

Proton beam therapy

Powerful but expensive way to treat the small number of cancers in hard to reach sites. Relatively low number of patients means there is limited clinical trial data to support its use to NICE standards of evidence.

- PBT - a more precise form of radiotherapy - causes less damage to healthy tissues adjacent to tumour sites.
- Particularly suitable for eye, head & neck and spinal tumour sites.
- PBT is expensive. A proton source and gantry system is around 50 to 100 times more expensive than a conventional linear accelerator (£150m for PBT, £1.5m - £2.5m for a linacc).
- Clinical evidence suggests that in the UK around 1,600 cancer patients a year would benefit from the treatment, including 300-400 children
- But should the NHS make the £150m - £450m investment to replace its one old PBT machine (which can only treat eye tumours) for 1, 2 or 3 larger modern machines?

Proton beam therapy (cont'd)

- Approach: build a simulation model to track through 20 years of treatments with and without PBT, and to follow the patients through to death.

- The total QALY benefit of the treatment can be estimated from the available evidence of the anticipated case mix.
- Sensitivity analysis is then used to test different investment options.

- This provides sufficient evidence to support a decision to invest now, in the absence of statistically robust clinical trail data.

Survivorship Baseline Data

- National Cancer Survivorship Initiative (NCSI) looking at alternative models of post-treatment care for cancer patients
- NCSI needed a better understanding of the baseline.

Two parts:

1. Retrospective case note review of just under 600 patients, where nurses gathered structured data by looking through each patient's case notes.
   - To estimate the cancer centre costs of follow-up over a 5-year period.

2. Survey of more than 1,000 patients in cancer follow-up clinics, based on a prospective audit of patients (adults and children & young people) attending relevant hospital outpatient clinics over an eight-week period.

Survivorship Baseline Data - Results

- Breast cancer follow-up lower cost than for the other cancer types considered (e.g. colorectal, prostate, head and neck).
- Significant variation in cost between hospitals (e.g. £679 to £965 for breast cancer).
- Costs concentrated in the years closest to diagnosis.
- Around 40% of identified cost related to unplanned activity. Variation in the unplanned percentage notable between cancer types.
- Around 70-80% of recorded events arise from routine follow-up. 10-30% of unplanned events are patient triggered.
- Significant variation in staff mix used between hospitals.
- Analysis provided detailed counts of investigations by cancer type.
- Overall extrapolated cost for patients treated in the past 5 years (only for the cancers studied) estimated at £222m/annum.
- In retrospect, more detailed inpatient costings could have been calculated using HES data and HRGs, but would have been complex.

Impact Assessment for the Cancer Strategy

- *Improving Outcomes: A Strategy for Cancer* (IOSC) was published in January 2011, accompanied by an Impact Assessment (IA).
- The analysis for the IA focussed on

  (i) increases in access to radiotherapy,

  (ii) implementation of existing cancer screening programmes, plus a new programme to implement bowel screening, using flexible sigmoidoscopy as a one-off screening, plus HPV triage;

  (iii) earlier diagnosis through raised awareness and increased access to diagnostic tests;

  (iv) improved information collection.
- Analysis required for the IA was challenging, generally due to the patchy evidence regarding benefits and cost-effectiveness.

Future Issues

NHS Outcomes Framework (NHS OF)

- Initial set of indicators in the NHS OF includes 1-year and 5-year survival rates for colorectal, breast and lung cancers.
- A number of other indicators also relevant to cancer patients.
- Major analytical challenges:
  - Projecting these indicators forward on a counterfactual basis
  - Looking at alternative levels of ambition.

Data

Evidence is often patchy. Typical problems include, eg:

- Lack of comparators or control groups
- Difficult to link routine datasets, eg HES and registry data
- Not much evidence on benefits, especially Quality of Life changes for cancer patients, including End-of-Life care
- Lack of consensus about appropriate measurement and terminology for benefits, eg QALYs, or life-years saved, or “avoidable deaths”, or “lives saved”