



CENTRE *for*
SUSTAINABLE
HEALTHCARE
inspire • empower • transform

How can research help to create more sustainable
COPD services?

Mark Starr, PhD
23.03.2012

COPD – THE LANDSCAPE

COPD Health Resource Groups

	Finished consultant episodes 2010-2011	Estimated spend based on 2011-2012 tariffs	Tonnes CO2e based on 2010 NHS England carbon intensity factor
COPD or Bronchitis without NIV without Intubation with CC	84,037	£192,612,804	105,744
COPD or Bronchitis without NIV without Intubation with Major CC	27,963	£145,211,859	79,721
COPD or Bronchitis with length of stay 1 day or less discharged home	71,332	£38,875,940	21,343
COPD or Bronchitis without NIV without Intubation without CC	13,165	£23,130,905	12,699
COPD or Bronchitis with NIV without Intubation with CC	4,201	£11,695,584	6,421
COPD or Bronchitis with NIV without Intubation with Major CC	2,337	£7,604,598	4,175
COPD or Bronchitis with NIV without Intubation without CC	223	£491,715	270
COPD or Bronchitis with Intubation with CC	137	£308,935	170
COPD or Bronchitis with Intubation with Major CC	73	£233,892	128
COPD or Bronchitis with Intubation without CC	8	£16,912	9
TOTAL	203,476	£420,183,144	230,681
	episodes		tonnes CO2e

COPD – THE LANDSCAPE

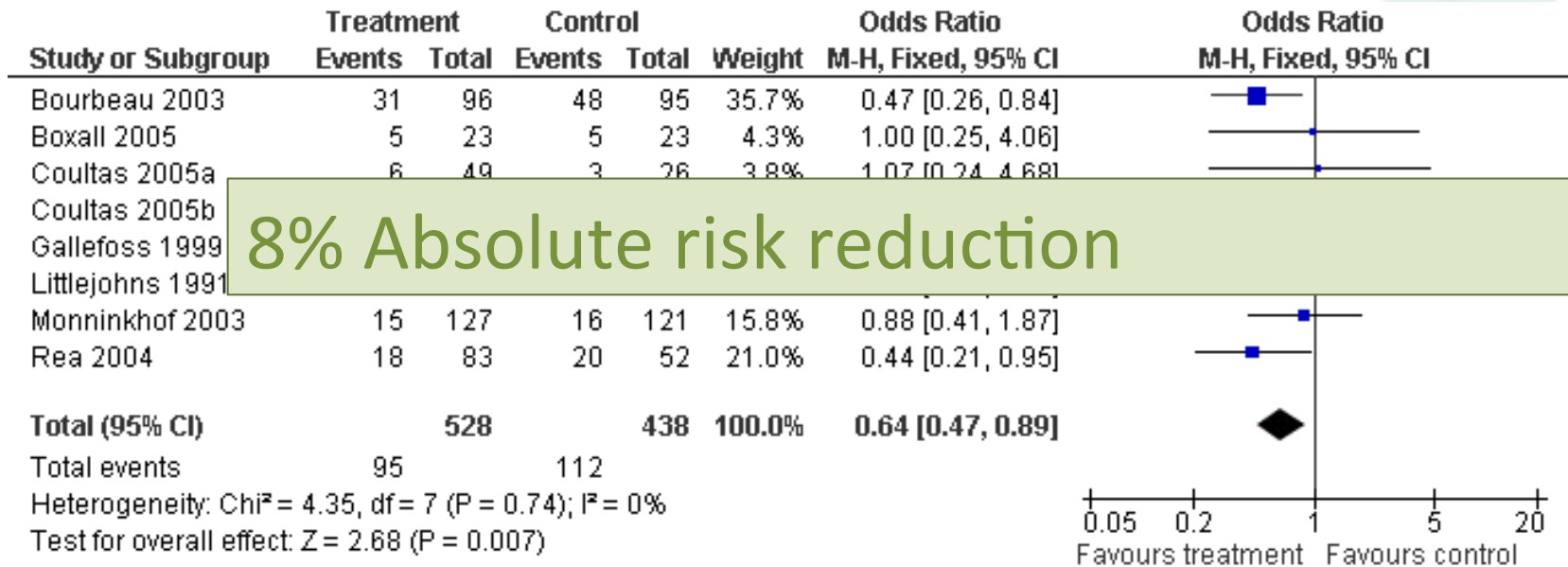
- Accounts for roughly 1.15% of NHS total CO₂e emissions
- Average monetary cost of £2,065.03 per consultant episode
- Average CO₂e emissions of 1133.70 kg per episode (over 1 tonne CO₂e)
- Plus hidden emissions:
 - Inhaler Hydrofluorocarbons not included in NHS footprint are estimated at 1.744 million tonnes of CO₂e (Smith & Tiner 2011)
 - Equivalent to 7% of NHS total

HOW CAN CLINICAL RESEARCH HELP TO CREATE MORE SUSTAINABLE SERVICES?

Two examples:

- Self-management education for patients with chronic obstructive pulmonary disease (Cochrane review)
- Telehealthcare for chronic obstructive pulmonary disease (Cochrane review)

Self-management education for patients with chronic obstructive pulmonary disease



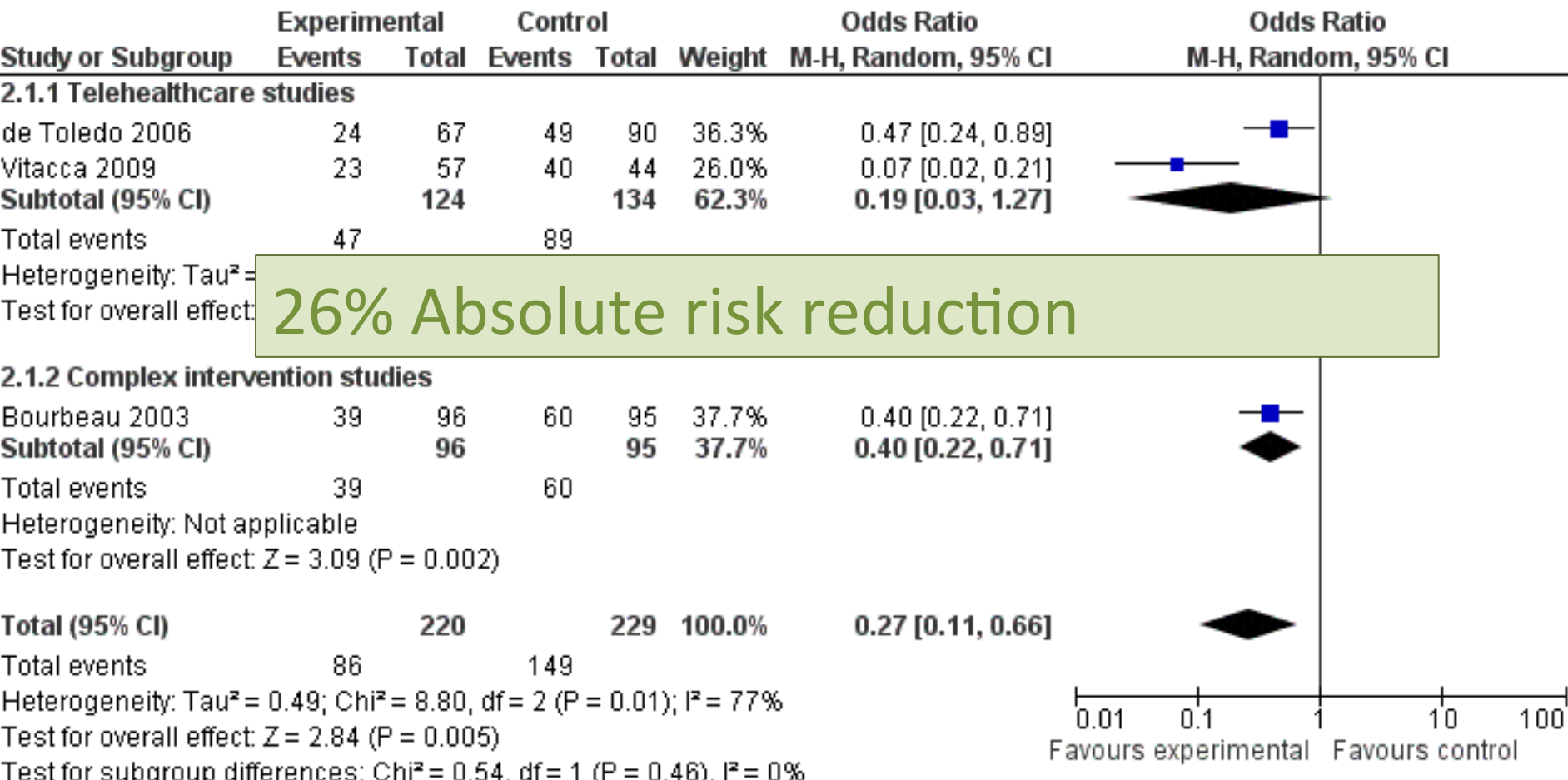
Forest plot of comparison: 1 Self-management versus control, outcome: 1.16
Respiratory-related hospital admissions

What savings could be achieved with a 8% reduction in hospital admissions?

Self-management education for patients with chronic obstructive pulmonary disease: 8% reduction in respiratory-related hospital admissions	Admissions 8% savings	Savings £	Savings tCO2e
DZ21A COPD or Bronchitis with length of stay 1 day or less discharged home	3,970	2,163,432	1,187.72
DZ21B COPD or Bronchitis with Intubation with Major CC	4	11,534	6.33
DZ21C COPD or Bronchitis with Intubation with CC	8	17,318	9.51
DZ21D COPD or Bronchitis with Intubation without CC	0	676	0.37
DZ21E COPD or Bronchitis with NIV without Intubation with Major CC	117	380,848	209.09
DZ21F COPD or Bronchitis with NIV without Intubation with CC	216	600,676	329.77
DZ21G COPD or Bronchitis with NIV without Intubation without CC	12	26,284	14.43
DZ21H COPD or Bronchitis without NIV without Intubation with Major CC	967	2,881,554	1,581.97
DZ21J COPD or Bronchitis without NIV without Intubation with CC	3,420	7,838,823	4,303.51
DZ21K COPD or Bronchitis without NIV without Intubation without CC	639	1,121,950	615.95
TOTAL SAVINGS	9,351	£15,043,096	8,258.66

Telehealthcare for chronic obstructive pulmonary disease

Susannah McLean, Ulugbek Nurmatov, Joseph LY Liu, Claudia Pagliari, Josip Car, Aziz Sheikh



26% Absolute risk reduction

Forest plot of comparison: 2 Emergency Dept Visits, outcome: 2.1 Number of patients with one or more emergency dept attendance over 12 months.

What savings could be achieved with a 26% reduction in emergency department visits?

Telehealthcare for chronic obstructive pulmonary disease: 26% reduction in number of patients with one or more emergency dept attendance over 12 months.	Emergency attendance reduction	Savings (£)	Savings tCO2e
DZ21A COPD or Bronchitis with length of stay 1 day or less discharged home	12,461	6,790,973	3,728
DZ21B COPD or Bronchitis with Intubation with Major CC	11	35,821	20
DZ21C COPD or Bronchitis with Intubation with CC	25	56,285	31
DZ21D COPD or Bronchitis with Intubation without CC	1	2,199	1
DZ21E COPD or Bronchitis with NIV without Intubation with Major CC	329	1,069,395	587
DZ21F COPD or Bronchitis with NIV without Intubation with CC	679	1,891,394	1,038
DZ21G COPD or Bronchitis with NIV without Intubation without CC	35	77,396	42
DZ21H COPD or Bronchitis without NIV without Intubation with Major CC	2,959	8,820,958	4,843
DZ21J COPD or Bronchitis without NIV without Intubation with CC	10,815	24,789,080	13,609
DZ21K COPD or Bronchitis without NIV without Intubation without CC	1,934	3,397,370	1,865
TOTAL SAVINGS	29,249	£46,930,869	25,765

CLINICAL TRIAL DATA

- Where uncertainty exists interventions must be tested in clinical trials – if an intervention doesn't work it is not sustainable.
- If an intervention has been shown to be effective, ask what is the environmental impact of that intervention? Does it cost more than it saves?
- Effective interventions become part of a complex of interventions that should be monitored and evaluated at the local level, in context.

COMPLEX INTERVENTIONS: BACKGROUND

Last year: We were asking “What is the carbon footprint of COPD care?”

This year: Focus is on assessing the environmental impact of complex COPD services and integrated care pathways

Next year: Sustainable COPD care in the round – including patient satisfaction, staff engagement and other measures of social sustainability

THE PROBLEM WITH FOOTPRINTS

Unit of interest is the organisation,
which is described in terms of

- Building energy
- Travel
- Procurement
- Waste



THE CENTRE FOR SUSTAINABLE HEALTHCARE

Work with specialties focuses on

- the services offered by the organisation, and
- the care pathways followed by individuals



ORGANISATIONS EXIST TO PROVIDE SERVICES

Service Line Reporting

“Costs should be matched to the services that generate them and should reflect the full cost of the service delivered.”

Service Line Reporting

*“Costs should be matched to the services that generate them and should reflect the **full cost** of the service delivered. This will be best achieved by... adopting a standardised approach to the apportionment of overheads and indirect costs.”*

NHS Costing Standards 2010/201. <http://www.dh.gov.uk/en/Managingyourorganisation/NHScostingmanual/index.htm>

Service Line Reporting

Measuring environmental costs would include footprinting measures:

- Using CO₂e as the common currency
- Specifying boundary conditions
- Agreeing basic reporting categories
- Establishing activity-to-CO₂e conversion factors

THE FULL COST OF SERVICES

Scope	Reporting Categories
Scope 1	Owned buildings – gas
	Owned buildings – coal and oil
Scope 2	Electricity
Scope 3	Leased Assets (upstream) – gas, coal, oil and electricity
	Leased Assets (downstream) – gas, coal, oil and electricity
	Capital goods
	Business travel – air
	Business travel – road
	Business travel – rail
	Patient and visitor travel
	Employee commute
	Healthcare purchased from other providers
	Pharmaceuticals
	Medical instruments
	Waste and water
	Discretionary – additional specific categories

Source: Association of Public Health Observatories. Technical Briefing Number 9: Measuring Sustainable Development, 2011.

<http://www.apho.org.uk/resource/item.aspx?RID=100183>

The Bridge - To support Service Line Reporting:

PLICS - Patient Level Information and Costing Systems

WHAT IS PLICS?

- It is an itemised account of the health care provided to a patient and the costs associated with that activity.
- A bottom up approach to costing rather than a traditional top down approach
- By costing at a patient level, allows organisations to either aggregate up to a particular service or speciality or down to provide detail of how the costs have been derived.

PLICS – A simple example

You get a detailed cost for each patient for what has happened to that patient:

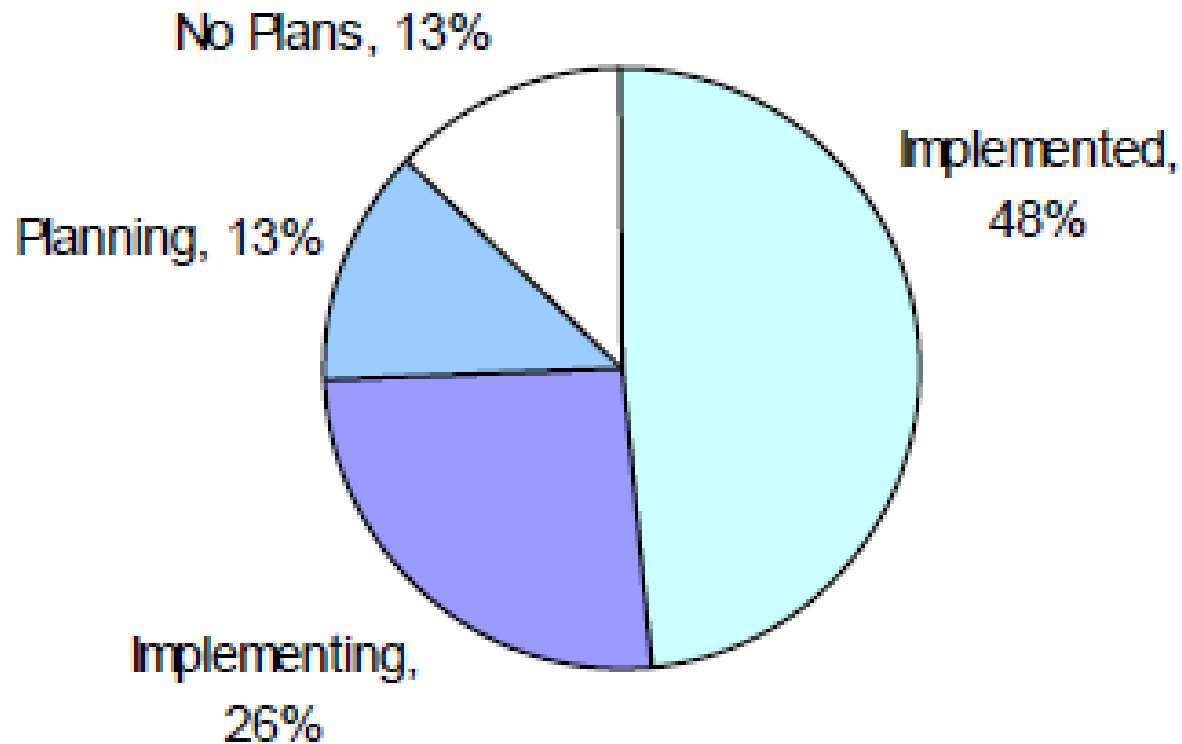
- Patient A: Face to Face contact
- ref 204221 Home Visit
- Staff time = 30 mins @ £30 an hour = £15
- Travel time = 45 mins @ £40 an hour = £30
- Booking appointment = 15 mins @ £16 = £4
- Overheads = £21

- Total cost £70 for ref 204221

PLICS FOR FINANCIAL MANAGEMENT

- The DH has not mandated the implementation of PLICS for NHS organisations,
- but strongly supports the implementation of PLICS, concluding that
- “Understanding cost drivers helps to inform decision making enabling meaningful and evidence based discussions between finance professionals, clinicians and commissioners.”

Percentage of acute organisations with PLICS 2010/2011



PLICS Survey

<http://www.dh.gov.uk/health/2011/11/plics-survey-results/>

PLICS FOR COMMISSIONERS

- *The Chartered Institute of Public Finance and Accountancy (CIPFA) has suggested that PLICS are used to create **Patient Level Care Pathway Costings**.*
- They suggest Commissioners could then analyse the cost of treating patients based on groups of patient need, and take into account the full pathway through Primary, Secondary and Community Services

PLICS FOR COMPLEX INTERVENTIONS

Research: How to allocate the key issue (e.g. cluster randomisation)

Data Collection and Evaluation:

- Group patients on common pathways (e.g., home care)
- Monitor indicators (admissions, exacerbations)
- Investigate variances
- Monitor costs - financial & environmental

PLICS FOR ENVIRONMENTAL COSTS

Assemble footprints from patient data by

- Apportioning data from standard reporting categories, e.g. staff commuting, building heat and electricity, other overheads
- Recording patient, visitor, and staff business travel, procured goods used, including pharmaceuticals
- Produce sustainability reports on services by aggregating data from those patients making use of the services

CONCLUSION

Accounting for carbon costs should be done at the patient level and follow the same principles and practices as used when accounting for money and other resources

- *Puts environmental costs along side financial costs – a move toward the triple bottom line*
- *Engages clinicians and others working on delivering care in sustainability*
- *Brings sustainability research into the mainstream of information management*
- *Footprinting is in some circles suspect, while cost accounting familiar and recognised as necessary*

NEXT STEPS

- 1) Breakdown the current carbon costs of COPD respiratory services, based on a top down approach using national data such as HRG, tariff, and NHS carbon footprint data.
- 2) Document how these estimated carbon cost/conversion factors could be improved using bottom up information.
- 3) Model the carbon costs of alternative care pathways for the management of COPD, ideally with patient level data.