The Scottish Government
Riaghaltas na h-Alba

HEALTH AND SOCIAL CARE

Programme Budgeting in NHSScotland 2011/12

Contents

Programme Budgeting in NHSScotland 2011/12: an update to Testing the Approach in Scotland[1]

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Executive Summary

- The programme budgeting analysis shows that in 2011/12 the largest areas of spend across NHSScotland were for the disease categories Mental Health, Circulation, Respiratory, Gastro-Intestinal and Cancer. Together these 5 categories were responsible for over a third of spend, at approx. £3,305 million: they represented 8.6%, 8.6%, 6.3%, 6.2% and 5.9% of the total identified (£9,282 million) respectively.

- Spend across all 23 programme budgeting categories is presented along with additional detail for 4 of the highest spending. The pattern of spend is similar, although not identical, to that within the NHS in England and Wales. Like other analyses of cost data it confirms that the majority of that spend was within the acute hospital sector.

- This paper is an update to a 2012 paper which, using data from 2007/08, described two possible approaches to identifying the costs associated with particular programmes of care in NHSScotland. The second of these approaches was the application of programme budgeting methodology, as used in both England and Wales, to disaggregate NHSScotland activity and costs by 23 diagnostic categories.

- Within the Health Care Quality Strategy for NHSScotland[2] one of the three quality ambitions is concerned with providing a more efficient and effective health service. Programme budgets allow us to view the data in a different way from that routinely published in Scotland, looking at the distribution of spend across disease categories. This, combined with outcome measures, can be used in discussion on the value for money associated with different programmes.

[1] Twaddle S. Marshall M. Michael N: Programme Budgeting - Testing the Approach in Scotland. 2012 http://www.scotland.gov.uk/Resource/0039/00391293.pdf
[2] The Scottish Government, May 2010. The Healthcare Quality Strategy for NHSScotland

Background

1. Programme Budgeting (PB) involves the presentation of estimates of expenditure in 'programmes' across an entire budget. For example within the health budget the programme may reflect different diseases, different levels of care (primary, secondary and tertiary) or different locations of care.

2. There is a high level of interest in information being provided in a different format than that routinely provided in the NHSScotland costs book[3]. The costs book provides a detailed analysis of where resources are spent in NHSScotland. It disaggregates by location of care – GP, community, hospital – and by health board, hospital and specialty. The analysis reported here focuses on why rather than where. It involved grouping expenditure and activity by the 23 programmes of care used in the NHS in England. These programmes reflect ICD10 disease categories, plus an 'other' category. A full description of the methodology is included in Appendix B.

3. Programme budgeting data has been routinely published for the NHS in England since 2002. Information on the process and aggregate results are published on the NHS England site[4]. A description of the early experience from England was included in the previous paper.

4. NHSScotland activity was allocated to these programmes, with the exception of community and prevention activity and expenditure, which it was not possible to disaggregate at this time. Total estimated expenditure by programme is disaggregated and shown in Table A1 in Appendix A.

Expenditure

5. The highest spending categories identifiable were mental health disorders, problems of circulation and respiratory problems. In common with England, the biggest spend was in the programme 'other', which incorporates much of the community activity in Scotland as well as other activity that cannot be allocated by diagnostic category.

[3] http://www.isdscotland.org/Health-Topics/Finance/Costs/

[4] http://www.england.nhs.uk/resources/resources-for-ccgs/prog-budgeting/

6. Table 1 shows that the distribution of spend across diagnostic categories in 2011/12 was very similar to 2007/08. The spend for 2 of these categories ("Healthy Individuals" and "Social Care Needs") are included in the spend for the "Other" category".

Table 1: Distribution of estimated spend by PB category (in £m) : NHSScotland 2011/12 and 2007/08

Programme Budgeting Category code	**Programme Budgeting Category**	All services (£m)	Percentage 2011/12 (%)	2007/08 (%)
1	Infectious Diseases	£99.2	1.1%	*1.1%*
2	Cancer & Tumours	£545.4	5.9%	*5.9%*
3	Disorders of Blood	£78.5	0.8%	*0.8%*
4	Endocrine, Nutritional & Metabolic Problems	£242.2	2.6%	*2.4%*
5	Mental Health Problems	£798.9	8.6%	*9.0%*
6	Problems of Learning Disability	£66.1	0.7%	*0.6%*
7	Neurological	£505.6	5.4%	*5.4%*
8	Problems of Vision	£231.0	2.5%	*2.3%*
9	Problems of Hearing	£26.7	0.3%	*0.3%*
10	Problems of Circulation	£796.6	8.6%	*9.4%*
11	Problems of the Respiratory System	£586.6	6.3%	*6.3%*
12	Dental problems	£474.1	5.1%	*4.6%*
13	Problems of the Gastro Intestinal System	£577.9	6.2%	*6.0%*
14	Problems of the Skin	£228.7	2.5%	*2.5%*
15	Problems of the Musculoskeletal System	£353.5	3.8%	*3.6%*
16	Problems due to Trauma and Injuries	£362.8	3.9%	*4.4%*
17	Problems of the Genito Urinary System	£367.3	4.0%	*3.9%*
18	Maternity and Reproductive Health	£328.9	3.5%	*1.0%*
19	Conditions of Neonates	£3.8	0.0%	*0.0%*
20	Adverse Effects and Poisoning	£118.3	1.3%	*1.1%*
21 – 23	All other Areas of Spend (inc. unclassified)	£2,490.1	26.8%	*29.3%*
Total		**£9,282.2m**		

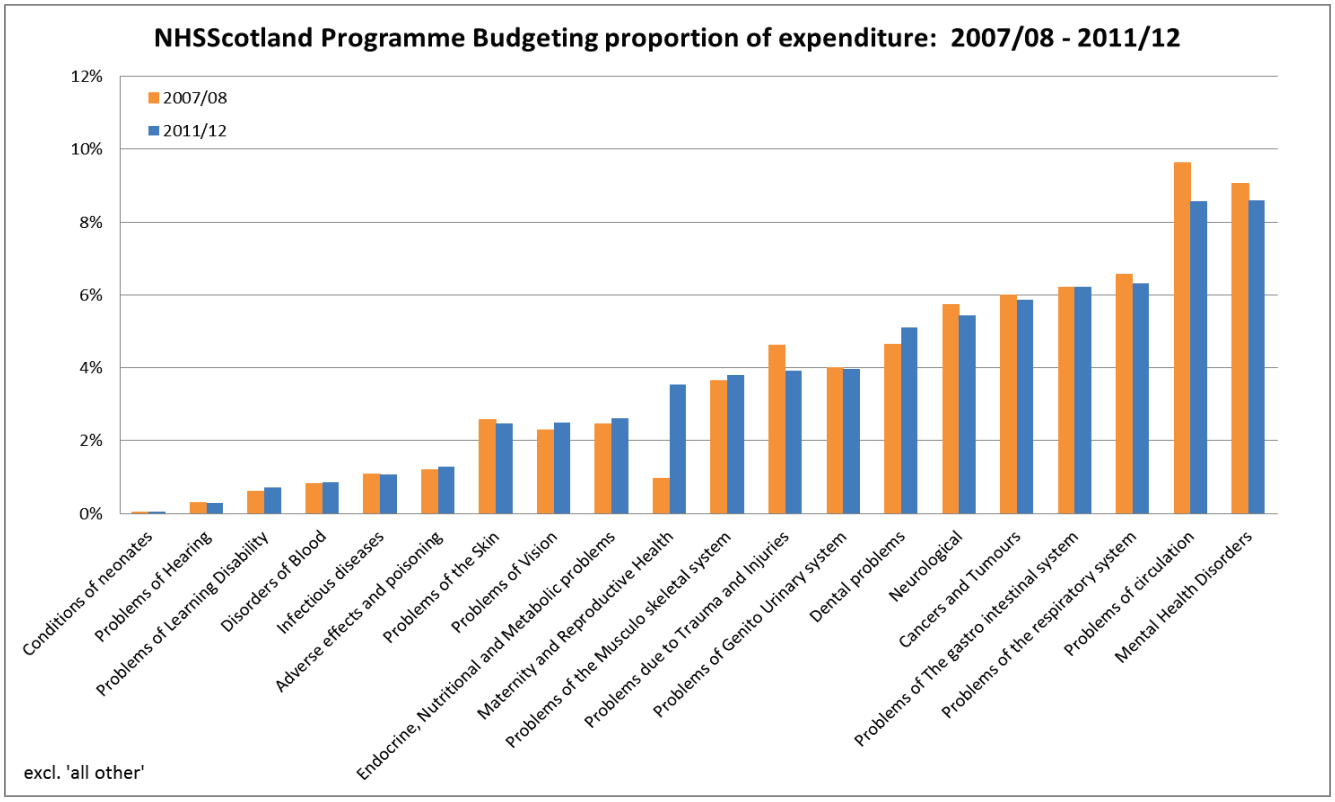
Source: ISD data request & analysis

7. The increase in the percentage spend on maternity between the 2 sets of data is because in the initial analysis it was not possible to map all maternity activity to that programme. This has now been rectified. The reduction in "other" is also due to the ability, for 2011/12 data, to allocate "accident and emergency" activity to relevant programme codes. For the 2007/08 data it was included in the "other" category.

8. Figure 1 illustrates this distribution of spend , excluding the category "Other".

9. In common with the data presented in the Costs Book[5] the programme budgeting exercise demonstrates that the majority of the spend is within the hospital sector. Table 2 illustrates this. Table A1 in the Appendix further disaggregates the spend shown in table 1 across the sectors identified in table 2.

Figure 1: Distribution of NHS Scotland spend by programme budget (excludes "other")



Source: ISD data request & analysis

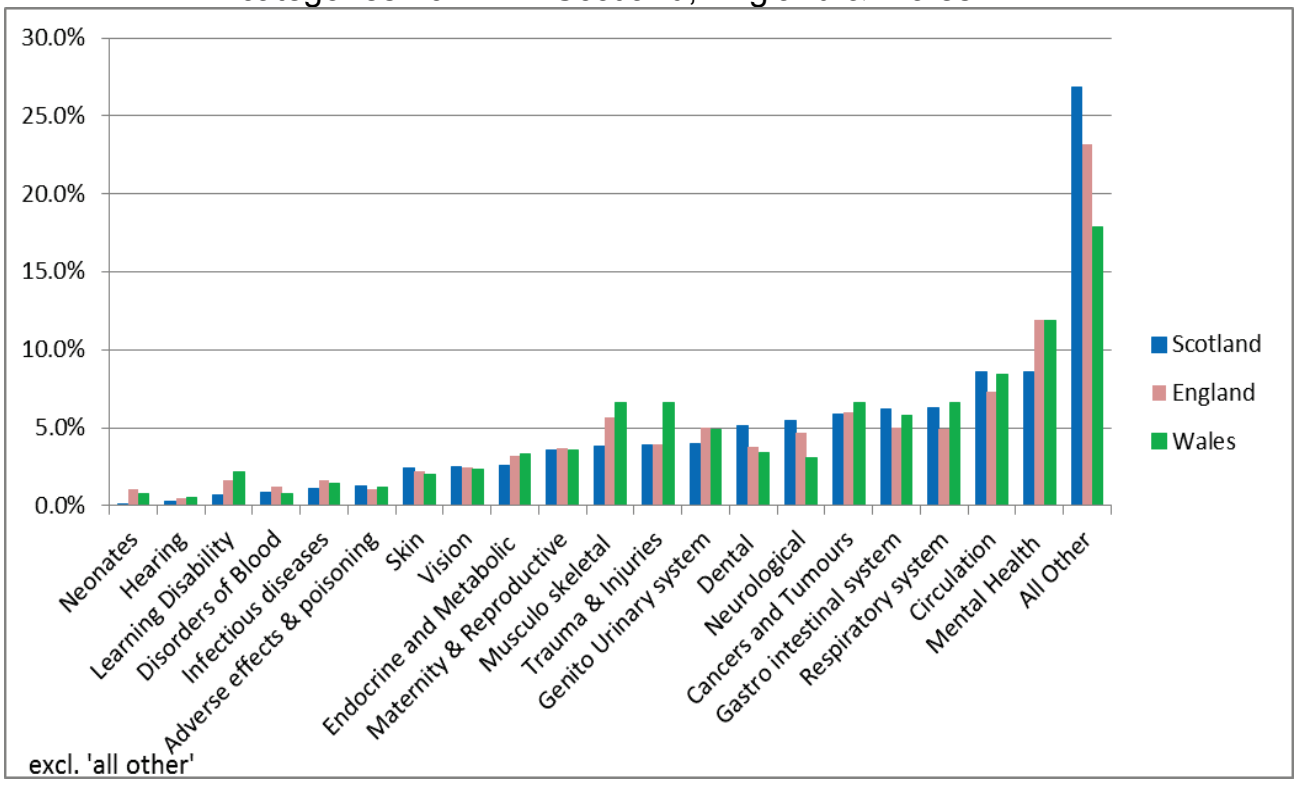
[5] Scottish Health Service Costs http://www.isdscotland.org/Health-Topics/Finance/Costs/

Table 2 : estimated cost by sector NHS Scotland 2011/12 (£m)

Hospital sector	
Acute Service	£3,109.2
Geriatric Long Stay	£133.1
Maternity Services	£251.9
Mental Health & Learning Disabilities	£600.5
Outpatient Services	£1,038.2
A&E	£175.1
Hospital sector sub total	**£5,308.0**
Community	
Community	**£1,558.7**
Family Health Services	
Pharmaceutical Services	£1,181.4
General Medical Services	£747.1
General Dental Services	£389.0
General Ophthalmic services	£97.8
FHS sub total	**£2,415.4**
Total: all services	**£9,282 million**

10. The distribution of spend across the programme budgeting categories in Scotland, England and Wales in 2011/12 is shown in Figure 2.

Figure 2: comparison of distribution of spend across programme budgeting categories 2011/12: Scotland, England & Wales



Source: Scotland, ISD request: England, Programme Budgeting Aggregate PCT Expenditure for all programmes and subcategories for financial years 2003/04 to 2012/13[6] . Wales, NHS expenditure by programme budget category: 2008-09 to 2012-13[7].

11. As can be seen from figure 2 the distribution of spend is similar across the 3 countries. Differences will be due to disparities in both supply of and demand for health care: and in data collection methods (e.g. in the Welsh data spend on GMS is included in the "other" category, in the Scottish analysis it has been possible to allocate activity, and cost, across the programme budget categories). The data used in this chart is shown in table A3 in Appendix A.

Detailed Programme budgets

12. Detailed examination of 4 of the programme budgets is presented: mental health, cancer, and both circulatory and respiratory disease. These are 4 of the 5 most costly programmes for the NHS. "Gastro intestinal (GI) conditions" is the 5th. Most of that spend on GI conditions is within the acute sector although there is £75m estimated for the spend on pharmaceutical items dispensed in the community.

13. Across all 3 countries whose programme budgeting data are presented in Figure 2, mental health has the largest proportion. There have been problems in Scotland with the completeness of SMR04 data (which is the data set which collects data on Psychiatric inpatients) submitted in recent years. As a result, from 2015, SMR04 has been re-designed and developed.

14. It should be noted that due to the implementation of a new patient management system, information on treatments delivered at NHS Ayrshire & Arran, in the hospital sector for mental health (i.e. from SMR04) in the year 2011/12, is not available. As a result, Scotland level data for mental health are not directly comparable to the previous analysis, or to similar services in the other UK countries. Comparison with England and Wales is further compromised by the inability to attribute community activity and spend across the programmes, including mental health.

[6] https://www.networks.nhs.uk/nhs-networks/health-investment-network/news/2012-13-programme-budgeting-data-is-now-available

[7] http://gov.wales/docs/statistics/2014/140611-nhs-expenditure-programme-budgets-2012-13-en.pdf

15. Mental illness is one of the major public health challenges in Scotland. Around one in three people are estimated to be affected by mental illness in any one year[8]. As shown in table 3 the spend is distributed across all areas of care with the majority of the identified cost attributed to psychiatric inpatient care although there is also a substantial spend in community prescribing.

Table 3: estimated expenditure for mental health sub programmes (2011/12) NHS Scotland (£m).

Sub Programme	**Hospital sector**					**Family health Services**		**Total**
	acute	geriatric long stay	mental health & learning disability	out - patient	A&E	pharmaceutical service	GMS	
Substance Misuse	£9.9	£0.3	£17.4		£1.6	£29.6	£4.2	£63.1
Organic Mental Disorders	£21.6	£16.5	£149.8		£1.1	£17.4	£0.9	£207.4
Psychotic Disorders	£1.1	£0#	£259.7		£0.1	£40.4	£0.9	£302.2
CAMHS	£0*		£4.3	£6.6	£0	£6.2	£0	£17.2
Other Mental Health	£4.1	£0.5	£92.9	£44.4	£0.5	£44.8	£21.9	£209.1
Total Mental Health	**£36.8**	**£17.3**	**£524.1**	**£51.0**	**£3.3**	**£138.4**	**£27.9**	**£799.0**

* - CAMHS has a separate data gathering exercise
# cells with £0 have less than £100,000 (rounded) spend in the year

16. The majority of cancer spend is in the acute sector, as might be anticipated. Table 4 shows that the greatest spend is on colo-rectal, lung, breast and haematological cancer (e.g. leukaemia and Hodgkins). This reflects both the pattern of incidence and prevalence of the disease within Scotland and the cost of treatment. Colon cancer is the 4th most commonly diagnosed cancer in both men and women: breast cancer is the most common cancer in women in Scotland accounting for almost 30% of all cancers diagnosed. Lung cancer is the most common cause

[8] http://www.scotland.gov.uk/Topics/Health/Services/Mental-Health

of death from cancer in both men and women[9]. The cost to GMS (GP visits) is relatively low. Whilst the costs cover both primary and secondary care sectors, the costs presented do not include costs for any of the national screening programmes. Nor do they include the cost of palliative care.

Table 4: estimated expenditure for cancer services (2011/12) NHS Scotland (£m).

Sub Programme	**Hospital sector**				**Family health Services**		**Total**
Site specific	acute	geriatric long stay	out - patient	A&E	pharma ceutical services	GMS	
Head and neck	£21.1	£0.2		£0.4		£0.1	£21.8
Upper GI	£39.9	£0.4		£1.3		£0.3	£41.8
Lower GI	£60.7	£1.2		£1.8		£0.3	£64.0
Lung	£44.2	£1.3		£1.8		£0.3	£47.7
Skin	£12.2	£0.3		£0.1		£0.3	£12.8
Breast	£40.7	£1.0		£0.3	£10.5	£0.4	£52.9
Gynaecological	£19.5	£0.4		£0.4	£0.1	£0.2	£20.5
Urological	£35.1	£0.9		£0.9	£4.0	£1.0	£42.0
Haematological	£62.9	£0.3		£1.0		£0.6	£64.9
Other Cancers & Tumours	£108.1	£2.5	£32.4	£2.4	£27.7	£3.8	£176.9
Total	**£444.5**	**£8.4**	**£32.4**	**£10.3**	**£42.3**	**£7.4**	**£545.4**

17. Whilst the spend on mental health and cancer appears to be concentrated in the acute sector, Tables 5 and 6 shows that diseases of circulation and the respiratory system make demands on both the acute sector and family health services where they are the most costly programmes. Diseases of circulation include coronary heart disease and cerebrovascular disease (stroke). The most common causes of death in Scotland are cancer, heart disease and stroke. Although the incidence of coronary heart disease is dropping, and survival rates from a first heart attack have risen over the last 10 years[10,] heart disease remains the second most common cause of death in Scotland.[11]

[9] http://www.scotpho.org.uk/health-wellbeing-and-disease

[10] https://isdscotland.scot.nhs.uk/Health-Topics/Heart-Disease/Publications/2014-01-28/2014-01-28-Heart-Disease-Summary.pdf?80317324400

[11] http://www.isdscotland.org/Health-Topics/Deaths/

Table 5: estimated expenditure for problems of circulation (2011/12) NHS Scotland (£m).

Sub Programme	**Hospital sector**				**Family health Services**		**Total**
	acute	geriatric long stay	out - patient	A&E	pharma ceutical service	GMS	
Coronary Heart Disease	£120.9	£2.9		£8.6	£97.6	£8.7	£238.8
Cerebrovascular disease	£93.5	£18.2		£4.7	£3.4	£6.7	£126.5
Problems of Rhythm	£40.9	£0.6		£3.8	£1.5	£6.9	£53.7
Problems of Circulation	£175.0	£7.2	£24.6	£8.5	£81.9	£80.4	£377.6
Total	**£430.3**	**£28.9**	**£24.6**	**£25.5**	**£184.5**	**£102.7**	**£796.6**

18. Respiratory conditions include Chronic Obstructive Pulmonary Disease (COPD) and asthma. COPD, for which the most significant risk factor is cigarette smoking, is the third most common reason for hospital admission in Scotland and has high re-admission rates. This may be due to the high smoking rates seen 30 - 40 years ago and increased awareness of COPD in primary care. Tables 5&6 also show the level of spend on pharmaceutical services for these groups of conditions. Table 6 includes the estimated cost of £100m on community prescribing for asthma. The UK has some of the highest rates of asthma in Europe. There were over 450,000 consultations for asthma with either a GP or practice nurse in 2011/12.[12] One in 14 adults and 1 in 13 children in Scotland are receiving treatment for asthma.[13]

[12] http://www.isdscotland.org/Health-Topics/General-Practice/GP-Consultations/Health-Conditions/Asthma/ PTI data

[13] http://www.asthma.org.uk/scotland

Table 6: estimated expenditure for respiratory disease (2011/12) NHS Scotland (£m).

Sub Programme	**Hospital sector**				**Family health Services**		**Total**
	acute	geriatric long stay	out - patient	A&E	pharma ceutical service	GMS	
Obstructive airways disease	£54.1	£2.0		£5.8	£46.5	£4.7	£113.0
Asthma	£10.0	£1.0		£1.7	£100.0	£8.6	£121.2
Problems of respiratory system	£227.4	£18.0	£18.6	£18.0	£16.1	£54.2	£352.3
Total	**£291.4**	**£20.9**	**£18.6**	**£25.5**	**£162.6**	**£67.5**	**£586.6**

19. The 2012 paper, reporting analysis of the 2007/08 data, reflected that the diseases and conditions generating most activity and subsequent cost were not distributed evenly across the population. For example, although there has been a reduction in mortality from coronary heart disease in all the deprivation quintiles there remains a strong social gradient[14]. There is a strong link between COPD and deprivation[15] and mental health is unevenly distributed across the Scottish adult population, with inequalities evident for age, gender, deprivation and socioeconomic status[16]. For some, but not all, cancers there is a clear social pattern to incidence. Of the most commonly occurring, (prostate, breast, colorectal, trachea, bronchus and lung), cancer of the trachea, bronchus and lung demonstrates the highest levels of inequality.[17] Similarly there is a link with deprivation for mortality from some cancers but not others. Again, mortality from lung cancer exhibits a high degree of inequality.

[14] http://www.isdscotland.org/Health-Topics/Heart-Disease/Topic-Areas/Deprivation/

[15] http://www.scotpho.org.uk/health-wellbeing-and-disease/chronic-obstructive-pulmonary-disease-copd/data/deprivation-data

[16] http://www.scotpho.org.uk/health-wellbeing-and-disease/mental-health/key-points

[17] *Long term monitoring of health inequalities: October 2014 report*. The Scottish Government.

20. The Gastro Intestinal category, another significant area of spend, covers a very wide range of conditions and activity. Many of these may have no link to deprivation. Others, such as liver disease, including hepatitis B and C, appear linked to deprivation and poverty.[18]

Discussion

21. Programme budgeting allows us to identify – in very broad categories - spend on particular diseases and particular areas of high spend which may be a source of budgetary pressure.

22. There are, however, a number of limitations worth noting:

- Not all activity can be mapped to an appropriate programme. This is particularly true of community activity where no diagnostic information is routinely collected. Prevention activity such as cancer screening programmes are also not well represented as they are included in the "other" category.
- For some sub programmes, (diabetes is a case in point) the reliance on first diagnostic place for coding may mean an under-recording of activity & associated cost against some programmes.
- The sub-programme approach may not be the most useful disaggregation for some types of disease. For example in cancer, it might be more appropriate to have analysis by stages of care – diagnosis, treatment, palliation.
- This analysis has given us a useful comparison over 2 time periods but most useful would be a continued time series to be able to observe change in the relative proportions of spend.

Conclusion

23. The pattern of spend by disease category identified for NHSScotland in 2011/12 is unsurprising given the main causes of morbidity and mortality. Although data are currently only available for two years – 2007/08 and 2011/12 – they show some change in the relative spend on different areas: the most notable being the decrease in the relative

[18] J G Williams, S E Roberts et al Gastroenterology services in the UK. The burden of disease, and the organisation and delivery of services for gastrointestinal and liver disorders: a review of the evidence. *Gut* 2007;56;1-113

spend on circulatory disease. The data also illustrate the considerable resource that is invested in treating mental as well as physical health.

24. This type of analysis is a useful tool for policy makers to inform them of the distribution of spend across disease categories. It allows consideration of whether that distribution is appropriate and as a basis for discussion and/or further analysis. Combined with outcome data it is possible to use programme budgeting data to assess the relative value for money of different programmes.

Appendix A

Table A1: Estimated cost by programme and sector NHS Scotland 2011/12

Code	Programme Budgeting Category	All Services	Percentage	Hospital Sector						Community	Family Health Services			
				Acute Services	Geriatric Long Stay	Maternity Services	Mental Health & Learning Disabilities	Out - patients	A&E		Pharma ceutical Services	General Medical Services	General Dental Services	General Opthalmic Services
1	Infectious diseases	£99,217,686	1.1%	£40,797,660	£317,808			£12,347,845	£3,500,380		£29,806,551	£12,447,441		
2	Cancers and Tumours	£545,352,542	5.9%	£444,477,215	£8,431,036			£32,377,743	£10,348,921		£42,328,376	£7,389,251		
3	Disorders of Blood	£78,460,037	0.8%	£30,566,051	£727,133			£32,765,269	£1,782,609		£6,647,566	£5,971,409		
4	Endocrine, Nutritional and Metabolic problems	£242,168,584	2.6%	£53,498,294	£1,173,241				£3,679,865		£158,402,306	£25,414,878		
5	Mental Health Disorders	£798,954,705	8.6%	£36,806,031	£17,327,896		£524,099,576	£51,030,113	£3,297,279		£138,436,268	£27,957,543		
6	Problems of Learning Disability	£66,108,203	0.7%	£324,453			£62,791,877	£2,811,321	£8,802		£0	£171,750		
7	Neurological	£505,624,483	5.4%	£271,332,941	£18,128,007		£8,216,472	£25,686,171	£29,431,402		£79,157,694	£73,671,795		
8	Problems of Vision	£230,962,341	2.5%	£69,434,354	£128,595			£43,133,369	£581,822		£15,218,741	£4,622,077		£97,843,383
9	Problems of Hearing	£26,736,209	0.3%	£15,382,718	£4,708				£345,229		£957,012	£10,046,542		
10	Problems of circulation	£796,581,848	8.6%	£430,301,124	£28,949,077			£24,644,017	£25,535,770		£184,458,810	£102,693,051		
11	Problems of the respiratory system	£586,556,226	6.3%	£291,423,153	£20,954,144			£18,649,853	£25,453,756		£162,600,961	£67,474,359		
12	Dental problems	£474,104,049	5.1%	£17,282,093				£31,109,227	£181,632	£34,655,464	£1,269,983	£579,207	£389,026,444	
13	Problems of the gastro intestinal system	£577,864,195	6.2%	£400,503,006	£3,955,827			£37,820,254	£23,021,911		£75,090,875	£37,472,323		
14	Problems of the Skin	£228,676,069	2.5%	£79,686,654	£1,199,725			£53,358,891	£4,287,450		£40,512,240	£49,631,110		
15	Problems of the Musculo skeletal system	£353,451,444	3.8%	£250,691,102	£2,458,010			£22,612,341	£3,580,032		£57,348,263	£16,761,696		
16	Problems due to Trauma and Injuries	£362,842,047	3.9%	£260,833,642	£10,365,251		£32,128	£58,018,848	£15,726,590		£10,275,171	£7,590,417		
17	Problems of Genito Urinary system	£367,337,843	4.0%	£207,783,856	£5,071,393			£59,331,460	£10,981,411		£48,713,238	£35,456,486		
18	Maternity and Reproductive Health	£328,868,252	3.5%	£19,060,307		£251,939,066		£30,573,219	£836,879		£11,546,485	£14,912,296		
19	Conditions of neonates	£3,786,111	0.0%	£3,460,433					£223,712		£39,339	£62,627		
20	Adverse effects and poisoning	£118,334,586	1.3%	£106,563,037	£574,409		£1,158,368		£8,790,024		£0	£1,248,748		
21-23	All Other	£2,490,102,538	26.8%	£78,973,650	£13,302,033		£4,188,614	£501,919,325	£3,548,471	£1,524,063,354	£118,610,922	£245,496,169		
	total	**£9,282,089,997**	**100%**	**£3,109,181,772**	**£133,068,292**	**£251,939,066**	**£600,487,035**	**£1,038,189,264**	**£175,143,948**	**£1,558,718,818**	**£1,181,420,799**	**£747,071,175**	**£389,026,444**	**£97,843,383**

Appendix A

Table A2: NHSScotland Programme budgeting analysis – 2011/12 – Inclusion/Exclusions

Service/Area	Data Source	Inclusions/exclusions	Additional notes
Acute Services	2011/12 SMR01 IRF costed data extract1	SMR01 IRF costed data extract is based on costs per episode. The following exclusions were applied to the SMR01 IRF costed file for the programme budgeting analysis: Activity at non NHS locations, Activity at NHS locations costed with national average costs, Discharges after end of financial year, Special Care Baby Unit. The IRF dataset includes Golden Jubilee and NSD funded services aswell as Younger physically disabled and rehabilitation activity. Non-elective activity is reported separately under Accident and Emergency.	Any difference between the SMR01 IRF costed file and the Costs Book was apportioned based on the distribution of the SMR01 based PBC data.
Geriatric Long Stay	2011/12 SMR01_E IRF costed data extract2	SMR01_E IRF costed data extract is based on costs per episode. The following exclusions were applied to the SMR01_E IRF costed file for the programme budgeting analysis: Activity at non NHS locations, Activity at NHS locations costed with national average costs, Discharges after end of financial year. The IRF dataset includes any applicable NSD funded services.	Total cost in the IRF costed file for GLS is approximately 20% lower than those reported in the costs book because of the current resident issue. For GLS the national dataset is discharge based and therefore current residents are not captured under-estimating activity and hence costs. GLS activity has been costed using unit tariffs calculated with Costs Book activity as the denominator to avoid over-costing of the activity that is in SMR01. Any difference between

Appendix A

			the SMR01_E IRF costed file and the Costs Book has been apportioned based on the distribution of the SMR01_E based PBC data.
Maternity Services	Costs Book	Includes Special Care Baby Unit.	
Mental Health & Learning Disabilities	SMR04 IRF costed data extract3	SMR04 IRF costed data extract based on costs per episode . The following exclusions were applied to the SMR04 IRF costed file for the programme budgeting analysis: Activity at non NHS locations, Activity at NHS locations costed with national average costs, Discharges after end of financial year, Special Care Baby Unit, State Hospital. The IRF dataset includes Golden Jubilee and any applicable NSD funded services.	For some SMR04 sites the calculated length of stay for financial year is much greater than the occupied bed days reported in the Costs Book. The Data Support & Monitoring Team continues to work with Boards to improve the completeness and quality of data (see ISD SMR completeness website http://www.isdscotland.org/Products-and-Services/Hospital-Records-Data-Monitoring/SMR-Completeness/) Any difference between the SMR04 IRF costed file and the Costs Book has been apportioned based on the distribution of the SMR04 based PBC data.
Outpatient Services	2011/12 Costs Book	Excludes A&E which is reported separately.	Other PBC category includes less specific specialties – e.g. General medicine

Appendix A

Accident and Emergency	SMR01 IRF costed data extract (non-elective patients only)1	Includes non-elective activity from the SMR01 IRF costed data extract. The following exclusions were applied to the SMR01 IRF costed file for the programme budgeting analysis: Activity at non NHS locations, Activity at NHS locations costed with national average costs, Discharges after end of financial year, Specal Care Baby Unit. The IRF dataset includes Golden Jubilee and any applicable NSD funded services as well as Younger physically disabled and rehabilitation activity.	
Community	2011/12 Costs Book	The Other PBC category will include Community Midwifery, Community Psychiatric teams, Learning Disabilities services and Community Nursing and Health Visiting teams.	All community expenditure reported in the 2011/12 Costs Book has been allocated to the Other PBC category, except community dental (Report R820) which can be explicitly identified.
Pharmaceutical Services	2011/12 Prescribing Cost analysis and 2011/12 Costs Book	Hospital prescribing excluded – already included in Acute Services costs.	The Other PBC category includes dressings etc.
GMS	2011/12 PTI estimates of GP Practice consultations; 2011/12 Costs Book		
Dental	2011/12 Costs		

Appendix A

	Book		
Ophthalmic	2011/12 Costs Book		

IRF 2011/12 mapping project. 2011/12 costed file for SMR01 (Acute Inpatients & Day cases); costed using Costs Book 2011/12 SFRs 5.3 and 5.5. SMR01 data extract as at April 2013.
IRF 2011/12 mapping project. 2011/12 costed file for SMR01_E (Geriatric Long Stay Inpatients); costed using Costs Book 2011/12 SFR 5.3. SMR01_E data extract as at April 2013.
IRF 2011/12 mapping project. 2011/12 costed file for SMR04 (Mental Health Inpatients); costed using Costs Book 2011/12 SFR 5.3. SMR04 data extract as at April 2013.

Appendix A

Table A3: Distribution of Programme budgeting spend across 3 nations: 2011/12.

Code	Programme Budgeting Category	Scotland	England	Wales
1	Infectious diseases	1.1%	1.6%	1.4%
2	Cancers and Tumours	5.9%	6.0%	6.6%
3	Disorders of Blood	0.8%	1.2%	0.8%
4	Endocrine and Metabolic	2.6%	3.2%	3.3%
5	Mental Health	8.6%	11.9%	11.9%
6	Learning Disability	0.7%	1.7%	2.2%
7	Neurological	5.4%	4.7%	3.1%
8	Vision	2.5%	2.4%	2.3%
9	Hearing	0.3%	0.5%	0.5%
10	circulation	8.6%	7.3%	8.4%
11	respiratory system	6.3%	5.0%	6.6%
12	Dental	5.1%	3.8%	3.4%
13	gastro intestinal system	6.2%	5.0%	5.8%
14	Skin	2.5%	2.2%	2.0%
15	Musculo skeletal	3.8%	5.6%	6.6%
16	Trauma & Injuries	3.9%	3.9%	6.6%
17	Genito Urinary system	4.0%	5.0%	4.9%
18	Maternity & Reproductive	3.5%	3.7%	3.6%
19	neonates	0.0%	1.0%	0.8%
20	Adverse effects & poisoning	1.3%	1.0%	1.2%
21-23	All Other	26.8%	23.1%	17.9%

Ref: Scotland, ISD request: England, Programme Budgeting Aggregate PCT Expenditure for all programmes and subcategories for financial years 2003/04 to 2012/13. Wales, NHS expenditure by programme budget category: 2008-09 to 2012-13 Wales

Appendix B

Appendix B: NHSScotland Programme Budgeting Methodology 2011/12 data

1. This document is intended to be read alongside the NHSScotland Programme Budgeting analysis showing estimated expenditure by Programme Budgeting category for 2011/12.

B1 Background

2. The Department of Health describes Programme Budgeting as follows:

The aim of the project is to develop a source of information, which can be used by all bodies, to give a greater understanding of where the money is going and what we are getting for the money we invest in the NHS.

The three main drivers of this are:
a way of monitoring where NHS resources are currently invested, e.g. for the purpose of
monitoring expenditure against National Service Frameworks a way of assisting in evaluating the effectiveness of the current pattern of resource deployment a tool to support and improve the process for identifying the most effective way of commissioning NHS services for the future.

3. At a basic level the exercise involves collating and presenting NHS expenditure on the basis of programmes of care rather than on the basis of inputs or accounting conventions.
This would track expenditure on patient care regardless of setting and therefore would cut across secondary, primary and community care.

4. Scotland does not currently collect programme level cost information from NHS Boards. The principal cost data collection is the Scottish Health Service Costs Book which reports expenditure on the basis of specialty or service (e.g. Family Health Services (FHS)).

5. Programme Budgeting expenditure for Acute, Geriatric Long Stay (GLS), Mental Health & Learning Difficulties and Accident & Emergency services has been estimated using the IRF (Integrated Resource Framework) Patient Level Costing Information System (PLICS) costing methodology. The PLICS costing methodology was developed for the IRF mapping and is now the accepted method of costing for NHS Scotland. PLICS apportions hospital site and specialty specific direct costs to individual patient records on admission, per day, for theatre time and specific high cost items e.g. prosthetics. As with other costing methodology, PLICS will continue to be developed as and when more appropriate information becomes available, for example high cost items,

average theatre times for elective and non-elective patients, etc. More information on the IRF PLICS costing methodology can be found in the paper published on the TAGRA website or from the IRF analytical team at NSS.isdIRF@nhs.net.

6. For Family Health Services, cost information is collected by ISD as part of the payments process which produces more detailed cost information for FHS prescribing and General Dental and General Ophthalmic Services.

B2 Datasets and analysis

7. In Scotland the approach taken to allocate costs to Programme Budgeting Categories (PBC) varied depending on the breadth and quality of the information available nationally. For example, acute inpatient and day case activity is now routinely costed as part of the IRF PLICS costing methodology, whereas within the Outpatient data collection system, there is little information on procedure and diagnoses to allow direct mapping of a PBC code. Wherever possible the most robust method for costing data has been used with a view to enhancing the methodology as the data becomes more readily available.

8. The 2011/12 Scottish Health Service Costs Book was used as the primary data source, with much of the programme budgeting category distribution based on analysis conducted using nationally available datasets.

9. Expenditure in this analysis has been mapped to the Scottish Health Service Costs Book 2011/12 (Report R300), excluding resource transfer.

10. The specific data used and approach taken is detailed in the sections below. More information on the data inclusions/exclusions, as well as additional notes can be found in Appendix C.

B3 HOSPITAL SECTOR

B3.1 Acute Services

11. In order to calculate Acute services expenditure by PBC, the 2011/12 SMR01 IRF costed file was run through the Health and Social Care Information Centre 2011/12 Healthcare Resource Group (HRG) Reference Costs grouper v4 which assigns an HRG and PBC code to each record. Once the PBC codes were attached to the file, the data was aggregated by PBC to obtain the sum of the costs for each PBC category.

12. The difference between the SMR01 IRF costs and the combined Inpatient, Day Case and Day Patient figures reported in the 2011/12 Costs Book

(Reports R310;R330;R370) was apportioned based on the distribution of the SMR01 IRF based expenditure.

B3.2 Geriatric Long Stay

13. Similar to Acute services, Geriatric long stay expenditure by PBC was estimated using the 2011/12 SMR01_E IRF costed file. A PBC was assigned using the 2011/12 HRG Reference Costs grouper v4; the file was then aggregated to obtain a cost for each PBC.

14. The difference between the expenditure reported in the 2011/12 Costs Book (R360) for Inpatient and Day Patient and the SMR01_E IRF costs was apportioned based on the distribution of the SMR01_E IRF based expenditure.

B3.3 Maternity Services

15. The Maternity datasets (SMR02 & Scottish Birth Record (SBR)) have not yet been investigated in terms of mapping to PBC. The figures reported in the tables have been taken directly from the 2011/12 Costs Book (Report R320) for Inpatients and Daycases and allocated to the "Maternity and Reproductive Health" PBC category. The figures reported in the Costs Book for Maternity Services include Special Care Baby Units.

B3.4 Mental Health & Learning Disabilities

16. PBC codes were matched on to the 2011/12 SMR04 IRF costed file using the HRG grouper software and aggregated to obtain a cost per PBC as per the Acute and Geriatric Long Stay analysis. The difference between the expenditure reported in the 2011/12 Costs Book (R340;R350) for Inpatient and Day Cases and the SMR04 IRF costs was apportioned using the distribution of the SMR04 IRF based expenditure.

B3.5 Outpatients

17. The SMR00 Outpatient dataset contains limited information on diagnosis and procedures for outpatient attendances; therefore cost data was taken from the 2011/12 Costs Book (Report R04opX) at Outpatient specialty level. The specialties were mapped to PBCs using the Department of Health's UNIFY2 Non Admitted Patient Care (NAPC) mapping file.

18. As the analysis was at specialty level only, it meant that much of the data was categorised into the "Other" PBC, as some specialties (e.g. General Surgery) cover numerous PBC categories rather than falling into one (e.g. Dental, Obstetrics). The complete list of specialties included in "Other" PBC is outlined in Appendix E.

19. The Costs Book Outpatient Specialty report (R04opX) excludes Allied Health Professional Costs & Activity, as they cannot be broken down by specialty. As these costs and activity cannot be accurately allocated to specific PBC codes, the AHP expenditure outlined in Costs Book report R046X was added to the "Other" PBC category.

20. The remaining difference between the combined total of reports R04opX and R046X and the R300 tables (based on sub-contracting fees not included in specialty level data) was allocated to PBC's based on the activity specialty proportions.

B3.6 Accident and Emergency

21. The figures for Accident and Emergency services are based on the non elective costs from the IRF SMR01 file using the same methodology as per the Acute, Geriatric Long Stay and Mental Health and Learning Difficulties. Similarly, the difference between non elective costs in the SMR01 IRF file and the 2011/12 costs book (Report R310) for Accident and Emergency patients was apportioned using distribution of costed activity. For any future analysis the possibility of using activity data from the A&E datamart would be investigated further as it may allow a breakdown by PBC category.

B4 COMMUNITY SECTOR

22. Currently community sector costs and activity are unable to be accurately allocated to programme budgeting categories. Therefore all community expenditure reported in the 2011/12 Costs Book has been allocated to the "Other" PBC category, except community dental (Report R820) which can be explicitly identified. The "Other" PBC category will include Community Midwifery, Community Psychiatric teams, Learning Disabilities services and Community Nursing and Health Visiting teams.

B5 PHARMACEUTICAL SERVICES

B5.1 Prescribing (Prescribing Information System (PIS))

23. Prescription Cost Analysis 2011/12 data was obtained from the ISD prescribing website and the "Total for Chemical names" sheet extracted, which lists the number of items prescribed and Gross Ingredient cost (GIC) by individual chemical names. The data was allocated to PBC's using the Department of Health's British National Formulary (BNF) to PBC mapping file and an additional excel mapping file which detailed the percentage share of the total for each drug for each relevant PBC. Some drugs can be used to treat

more than one type of condition, therefore the analysis needed to take this into account when allocating expenditure in order to sufficiently reflect activity & cost by programme budgeting category. An example of the allocation mapping methodology is detailed in Table B1.

B5.2 Other Pharmaceutical Services

24. The outstanding pharmaceutical expenditure reported in the 2011/12 Costs Book (Report R390) was apportioned to PBC based on the distribution of the allocated drug expenditure.

Appendix B

Table B1 : example of prescribing mapping tool.

SECTION	SUB-SECTION	PARAGRAPH	CHEMICAL SUBSTANCE	PBC	Level (for matching to Prescribing Data)	BNF subsection	BNF Chemical Name	Paragraph	1A	2F	2G	2H	4B	18X	23X	Total
8.3 Sex hormones and hormone antagonists in malignant disease																0
	8.3.1 Oestrogens			2H / 2F (90:10)	sub-section	080301				10		90				100
	8.3.2 Progestogens															0
			MEDROXYPROGESTERONE ACETATE	2F / 2G / 2H (20:60:20)	chemical sub	080302	Medroxyprogesterone Acetate			20	60	20				100
			MEGESTROL ACETATE	2F / 2G (40:60)	chemical sub	080302	Megestrol Acetate			40	60					100
			NORETHISTERONE	2F / 18X (10:90)	chemical sub	080302	Norethisterone			10				90		100
	8.3.3 Androgens			?	sub-section	080303										0
	8.3.4 Hormone antagonists															0
		8.3.4.1 Breast cancer		2F	paragraph			08030401		100						100
		8.3.4.2 Prostate cancer and gonadorelin analogues														0
			BICALUTAMIDE	2H	chemical sub	080304	Bicalutamide					100				100
			BUSERELIN	2H	chemical sub	080304	Buserelin					100				100
			CYPROTERONE ACETATE	2H	chemical sub	080304	Cyproterone Acetate					100				100
			FLUTAMIDE	2H	chemical sub	080304	Flutamide					100				100
			GOSERELIN	2H / 4B / 2F	chemical sub	080304	Goserelin			34		33	33			100
			LEUPRORELIN ACETATE	2H / 4B	chemical sub	080304	Leuprorelin Acetate					50	50			100
			TRIPTORELIN	2H / 4B	chemical sub	080304	Triptorelin					50	50			100
		8.3.4.3 Somatostatin analogues		4B	paragraph			08030403					100			100

Appendix B

B6 FAMILY HEALTH SECTOR

B6.1 Practice Team Information (PTI) estimated consultations

25. General Practice surgeries use a different diagnostic coding system to the hospital setting, using Read codes rather than ICD10 diagnostic codes. As PBC mapping relies on ICD10 codes, this involved mapping Read codes to ICD10 codes before mapping to PBC categories.

26. ISD's PTI team carried out an appropriate mapping of PTI data and provided GP Practice consultation estimates by PBC for 2011/12. Unlike with SMR submissions, Practice staff tend not to use a "main diagnosis" code, but rather list all relevant codes for the individual consultation. This means that one consultation may be counted in more than one PBC as no assumptions can be made regarding which is the "main" diagnosis. The method described below was applied to the data to account for this.

27. Costs were apportioned using the percentage distribution of PBC's (using the sum of the individual PBC consultations rather than the total number of consultations, as this was the greater figure). Expenditure was taken from the 2011/12 Costs Book (Report R390 – General Medical Services).

28. The difference between the total number of estimated consultations from PTI and the sum of the individual PBC's was calculated and this excess distributed among the PBC's using the percentage distribution calculated previously. The calculated excess was then subtracted from the estimated no. of consultations for each PBC category in order to obtain a total for each PB category which, when summed, matched the total estimated no. Of consultations from PTI.

B6.2 General Dental Services & General Ophthalmic Services

29. General Dental & General Ophthalmic Services 2011/12 costs have been taken directly from the 2011/12 Costs Book (Reports R820 & SFR8

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