

Practice-based commissioning: budget guidance for 2011/12

Methodological changes and toolkit guide

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- Changes to the recommended methodology for deriving practices' fair shares for 2011/12.
- Information on how to use the toolkit that can help PCTs set budgets.

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Practice-based commissioning: budget guidance for 2011/12

Methodological changes and toolkit guide

Prepared by Department of Health

Contents

Executive summary	4
Introduction	5
Calculating fair shares	6
The 2011/12 PBC budget toolkit	6
Acute component	6
Maternity component.....	7
Mental health component.....	7
Prescribing component	7
Disability Free Life Expectancy formula	8
Combining the elements of the formula.....	8
Pace of change	8
Data sources	9
How to use the new PBC toolkit.....	10
Downloading the toolkit and data	10
System requirements	10
Step by step instructions	10
Changing the practice data	12
Viewing the results	13
Advanced modifications	13
Annex A: additional technical detail on the new acute methodology.....	16
Annex B: Frequently Asked Questions	19
Annex C: Variables used in formulas.....	21
Acute component	21
Maternity component.....	21
Mental Health component	21
Prescribing component	22
DFLE formula.....	22

Executive summary

1. 2011/2012 is a transition year which will see pathfinder consortia and emerging consortia move closer towards GP-led commissioning as described in *Equity and Excellence: Liberating the NHS*¹, with groups of practices increasingly taking on devolved responsibility for commissioning decisions under the current statutory framework.
2. PCTs continue to be responsible for ensuring that practices receive an indicative budget that reflects the needs of their population as accurately as possible. This helps a practice to access a 'fair share' of the resources available to the whole of the PCT for its patients.
3. This document sets out changes to the recommended methodology for setting practice-based commissioning budgets. This year we have:
 - Updated the practice populations to those based on the April 2010 attribution data set
 - Updated the acute part of the budget formula, which is based on research led by the Nuffield Trust, with the latest data
 - Replaced the mental health and prescribing components with new formulas developed as part of changes to PCT allocations from 2011/12
4. The toolkit continues to include elements for maternity services and a DFLE formula based on PCT allocations methodology
5. The formula for allocating budgets by the NHS Commissioning Board to GP Consortia for 2013/14 and shadow budgets in 2012/13 remains under development. We expect that the Board may also centrally commission some services. However, this is a year of transition: membership of pathfinder and emerging consortia and PBC groups are under review in some areas, and the national pace of change policy and formulas determining allocations to all commissioners are under development.
6. So, if 'fair shares' and historic budgets or activity differ by more than a locally determined threshold, that difference should be reduced. However, as last year, there will be no mandatory minimum or maximum pace of change and PCTs and clusters should determine, with local agreement, how to apply pace of change as appropriate for their own local circumstances.
7. Alongside these changes to the methodology, we are issuing an updated toolkit to help PCTs when setting budgets, which builds on the improvements introduced last year. This guidance gives details on how to use this revised toolkit. The key new feature is the ability to operate at emerging consortia/PBC group as well as practice level.
8. Please send any questions about the toolkit or the content of this document to the PBC mailbox: psc@dh.gsi.gov.uk.

¹ <http://www.dh.gov.uk/en/Healthcare/LiberatingtheNHS/index.htm>

Introduction

9. The *Operating Framework for the NHS in England 2011/2012* emphasises that PBC groups, pathfinders and emerging consortia must be supported to take on increasingly devolved responsibility for commissioning decisions
10. Although this is a year of transition, PCTs remain responsible for ensuring that practices receive an indicative budget that reflects the needs of their population as accurately as possible. This allows a practice to access a 'fair share' of the resources available to the whole of the PCT for its patients.
11. This document sets out:
 - changes to the recommended methodology for deriving practices' fair shares for 2011/12; and
 - information on how to use the updated toolkit that can help PCT set budgets.
12. This guidance applies to 2011/12 only as further guidance will be developed and issued as the new arrangements for commissioning are considered.
13. Please send any questions about the toolkit or the content of this document to the PBC mailbox: pbcc@dh.gsi.gov.uk.

Calculating fair shares

14. The current PBC budget toolkit was released in January 2010 and was recommended for use in 2010/11.
15. The 2011/12 toolkit introduces new methodologies for the Prescribing and Mental Health parts of the toolkit. This is based upon the results of the *Resource Allocation for Mental Health and Prescribing (RAMP)*² project, which was developed as part of the methodology for PCT allocations.
16. In the 2010/2011 toolkit we introduced a new methodology for the Acute care component. This was based on research that the Department of Health commissioned from a team led by the Nuffield Trust to develop an acute formula based on the prediction of individual patient costs. We have retained this methodology for the 2011/12 toolkit and the data underlying the formula have been updated.

The 2011/12 PBC budget toolkit

17. The sections below provide more information about all elements of the formula.

Acute component

18. For acute services, the toolkit includes a Person Based Resource Allocation approach for calculating fair shares. Prior to 2009/2010, the toolkit has used the same methodology as PCT allocations. This relied on examining the relationship between spending in, and the characteristics of, small areas called MSOAs³. This was slightly problematic for PBC because it required these data to be 'attributed' to practices. Where practices' patients were not typical of the area (e.g. they were older or there were many students), the old fair shares formula would not reflect that difference. The new methodology retained the basic principle of estimating fair shares based on the relationship between spending and population characteristics, but:
 - bases this on more information about individual patients; and
 - includes information about previous diagnoses of patients rather than just their characteristics.
19. This methodology built on work done by the researchers on products such as the PARR⁴ tool and the latest developments in risk prediction from the US. It has been overseen by the Advisory Committee on Resource Allocation (ACRA).
20. Further technical details are given in Annex A, and in the Nuffield Trust's report *Developing a Person Based Resource Allocation Formula for Allocations to General Practices in England*⁵.

² *Resource Allocation for Mental Health and Prescribing (RAMP) Project*

http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_122619.pdf

³ Middle layer Super Output Area. These were created by ONS following the 2001 census. There are around 6780 in England and they have a minimum population of 5000.

⁴ Patients at Risk of Readmission (see

www.kingsfund.org.uk/research/projects/predicting_and_reducing_readmission_to_hospital/index.html for more information).

Maternity component

21. The maternity component is calculated using the same approach as PCT allocations. This is set out in *Resource Allocation: Weighted Capitation Formula – seventh edition*⁶. The methodology is unchanged from the last year's toolkit, although we have updated the variables where possible.
22. As last year, rather than attributing the number of births in each MSOA to practices, we use the number of under 1 year olds registered with each practice as an estimate of the number of births. The need indices used are based on low birth weight births and mean house prices.

Mental health component

23. For the mental health component of the toolkit we have adopted the new methodology developed for PCT allocations. This approach utilises data from the Mental Health Minimum Dataset (MHMDS) and for the first time means that the methodology was able to include community mental health activity as well as care in hospitals.
24. After careful evaluation we believe this offers more robust results at practice level than the survey-based approach used in 2010/11. It models mental health care at the LSOA⁷ level and this is then attributed to practices using the Attribution Data Set.(ADS)
25. The new methodology has undergone extensive testing by the researchers and DH. It has been overseen by the Advisory Committee on Resource Allocation and further information can be found in the RAMP report.
26. We are investigating the feasibility of a person-based approach using MHMDS data for modelling mental health in future.

Prescribing component

27. The methodology for the prescribing component has also been updated as part of the RAMP project. This maintains the link with the prescribing formula used for PCT allocations and the model operates at practice level.
28. The prescribing formula uses the new 2009 ASTRO-PUs as the basis for adjusting for age and sex related need. Additional need is modelled using data on Low Incomes Scheme Index (LISI) score and Quality and Outcomes Framework (QOF) data (at practice level) and some LSOA-based variables for deprivation and ethnicity attributed to practices using the Attribution Data Set (ADS).

⁵ http://www.nuffieldtrust.org.uk/uploadedFiles/Projects/Developing_a_person-based_resource_allocation_formula_REPORT.pdf?n=6255

⁶ <http://www.dh.gov.uk/en/Managingyourorganisation/Financeandplanning/Allocations/index.htm>

⁷ Lower Layer Super Output Area - (LSOA) These were created by the ONS following the 2001 Census. There are around 34,000 LSOAs in England with a minimum populations of 1,000.

Disability Free Life Expectancy formula

29. As with the methodology used to allocate funding to PCTs, we have included a separate disability free life expectancy formula (formerly known as the health inequalities formula) within the 2011/12 toolkit.
30. The methodology used for PBC maintains the approach used in PCT allocations. It uses Disability Free Life Expectancy (DFLE), combining 2005 life expectancy data with 2001 limiting long-term illness (LLTI) data, and so capturing morbidity as well as mortality. In common with other parts of the PBC formula, the ADS has been used to attribute these data from small areas to practices. ONS have now made DFLEs available at MSOA level and so in the 2011/12 toolkit we have attributed from MSOAs rather than wards. The formula is applied by comparing every practice's DFLE to a benchmark figure of 70 years. For example, a practice with a DFLE of 60 years has an index of 10. We apply this index to each practice's population to generate a DLFE formula weighted population.

Combining the elements of the formula

31. The current PCT allocation formula (used for allocations in 2011/12) uses weights derived from 2008/9 summarised PCT accounts to combine the components of the formula.
32. In the 2010/11 PBC toolkit we introduced weights that were specific to each PCT. This meant, for instance, that PCTs in deprived areas had a higher than average weight for the DFLE component.
33. To calculate these PCT-specific weights for 2011/12 we have analysed the *2011/12 PCT Recurrent Revenue Allocations Exposition Book*⁸ to generate the proportion of each PCT's target allocation that derives from each of the five components. These are given in the hidden sheet *PCT weights* in the toolkit spreadsheet, and a summary is given below.

Weights used for each component of the formula

Component	National Average	Smallest share in any PCT	Largest share in any PCT
Acute	62.3%	50.2%	70.8%
Maternity	3.7%	1.7%	6.9%
Mental health	12.8%	8.5%	22.5%
Prescribing	11.2%	7.6%	13.6%
DFLE formula	10.0%	3.5%	17.1%

Pace of change

34. The formula for allocating budgets by the NHS Commissioning Board to GP Consortia for 2013/14 and shadow budgets in 2012/13 remains under development. We expect that the Board may also centrally commission some services. However, this is a year of transition:

⁸ <http://www.dh.gov.uk/en/Managingyourorganisation/Financeandplanning/Allocations/index.htm>

the composition of pathfinder and emerging consortia and PBC groups are under review in some areas. The PBC formula is used in the toolkit to determine practices' fair shares of the resources available to the PCT. These resources are after pace of change has been applied to determine PCT allocations. In the future, any pace of change policy may be applied at emerging consortia level, but this is still to be developed, as are the formulas determining allocations to all commissioners.

35. If 'fair shares' and historic budgets/spending differ by more than a locally determined threshold, that difference should be reduced. However as last year, there will be no mandatory minimum or maximum pace of change and PCTs should, **with local agreement**, continue to roll over previously agreed local arrangements reflecting the guidance provided last year
36. The toolkit includes functionality to aid PCTs in this process of calculating pace of change, set out below.
37. The first step is that PCTs must input the 2010/11 budget for each practice (detailed instructions are in the second part of this guidance document). The second step (optional) is to enter a threshold (the default is 0%), which is then automatically adjusted for different practice list sizes. This defines the range within which pace of change is not applied. We expect small practices to experience more natural variation in need and spending than larger practices or PBC groups. The toolkit suggests a threshold for each practice and the formula used to calculate the threshold is:

$$\text{Pace of change threshold} = \pm x\% \times \frac{\sqrt{6500}}{\sqrt{\text{practice population}}}$$

Where x% is the threshold value inputted by the user. The 6,500 is based on the average practice population.

38. With local agreement, PCTs may operate pace of change at the level of PBC groups.

Data sources

39. The table in Annex C (and also in the table "Variable Descriptions" in the Access database part of the toolkit) provides details of the variables used in the formulae and their sources.

How to use the new PBC toolkit

Downloading the toolkit and data

40. The toolkit and data are available to download from the DH website. The toolkit is contained within a zip file. Most computers should be able to open and extract zipped files. If you have any difficulties please contact your organisation's IT support.
41. There are two files within the zip. These should be extracted and **must be placed within the same folder**.

System requirements

42. The toolkit is in the format of a Microsoft Excel spreadsheet. We have tested it in Excel 2002 (XP) and 2007. The toolkit should run on any PC that meets the minimum system requirements for Microsoft Excel. If you want to make modifications to the underlying data, then you will require Microsoft Access 2000 (or later). See the Advanced Modifications section for more information.
43. Macros must be enabled for the toolkit to work correctly. If you use Excel 2007, you may also need to enable links to external data⁹. For more information, see Annex B.
44. The zip file contains a spreadsheets and a database. Please save both the files into the same folder on your computer. The toolkit will not work if you open the spreadsheet from within the zip file, as it will be unable to find the database.

Step by step instructions

45. Open the Excel spreadsheet *PBC 2011-12 toolkit v1.xls*. If you are prompted when opening the toolkit, please select "Enable Macros"¹⁰. In Excel 2007 you will also need to give permission for access to external data. The spreadsheet should open on the worksheet labelled *Intro*. To begin using the toolkit, select the *Budget and Consortia*¹¹ *Info* sheet.
46. You will see instructions given in red and several yellow cells. Yellow cells are the ones that are designed to be changed by the user. The key cells in the sheet are:
 - B3: this is the PCT that the toolkit is currently showing. It can be changed by clicking the down arrow in the box to the right and selecting your PCT from the list. The list is in alphabetical order.
 - C6: The total PBC budget that the PCT wants to allocate should be entered here.
47. The table in the *Budget and Consortia Info* sheet contains information about PBC consortia that practices belong to. This data may be out of date and need updating. After changing consortia membership, press the update tables button.

⁹ In case of problems consult with your organisations IT department

¹⁰ If macro security is set to high, then macros will be automatically disabled and the toolkit will not work.

¹¹ Note that throughout the toolkit, where there are references to "consortia" this refers to pathfinder consortia, emerging consortia or PBC groups.

48. After completing steps 1 and 2, you can view information on recommended budget allocations for both practices and consortia groupings. If you would like to view budget allocations to practices, go to the *PracticeResults* sheet, or go to the *ConsortiaResults* sheet if you would like to view practice budgets grouped by consortia. **The *PracticeResults* and *ConsortiaResults* sheets are independent and changes to one will not affect the other.**
49. The key cells on the *PracticeResults* and *ConsortiaResults* sheets are:
- C3 & C4: These cells control the amount that practices/consortia are moved towards their fair share (“pace of change”) rather than allocating funding according to historic budget. Cell C4 defines the threshold at which practices/consortia outside that difference will be moved towards their fair share. The toolkit adjusts the exact level depending on practice/consortia size, with the level entered in this cell being that applied to the average practice (6,500 list size). C3 gives the amount that those practices/consortia outside the threshold will move towards their fair share. This is calculated as a proportion of historic spend (or historic budget – see bullet point below). These values can also be changed using the button on the charts.
 - Column L: This allows you to enter a figure for practices/consortia’s historic spend or practices’/consortia’s actual 2010/11 budget. The current figures are the fair share from last years toolkit and are included **for illustration only. These figures must be replaced with the 2010/11 budgets**, optionally adjusted for changes in list size. Any updated figures you enter here do not need to add up to the PBC budget total, as they are normalised automatically.
 - Column O: This column can be used to update the practice/consortia population to the latest available figures when budgets are set. The toolkit will apply a fixed fair share and historic spend per capita to any changes entered here so it should only be used for small corrections – any changes to population age or need profiles will not be reflected. Detailed data updates can be made using the methodology set out in the ‘Advanced Modifications’ section below.
 - Column X: This allows you to exempt individual practices/consortia from pace of change. This may be appropriate for certain practices that have unusual populations or circumstances, such as being mostly comprised of students. The sheet *Issues list* provides an analysis of some of these factors for each practice, although it is not meant to be prescriptive or comprehensive. Practices with ‘issues’ can be highlighted on the chart on the sheet *PracticeChart*. Paragraph 55 provides information on how to exclude individual practices completely¹².
 - Column Y: This contains the pace of change threshold for each individual practice/consortium, and is based on the figure in C11 and the pace of change formula. Practices/consortia will be moved toward their fair share if the absolute value of the figure in column V is greater than this value and column X is set to Yes.

¹² Note: practices with ‘issues’ highlighted must still be set a PBC budget, even if you conclude that this toolkit is not an appropriate basis for it.

50. Following the steps 1-6 in red defines the minimum that you will need to do to get recommended practice budgets for 2011/12. **The final figures are given in column AI.**
51. Explanations for most of the other columns are given in comments to the cells in row 23. You can see these by hovering your mouse over those cells (marked with a red triangle).

Changing the practice data

52. Although the steps above describe the minimum that PCTs will need to do to generate budgets using the toolkit, some may want to make some additional changes. These are set out below.
53. **Update the practice populations.** The populations shown are extracted from the 2010 Attribution Data Set and represent practices' composition in April 2010. Small changes to populations can be adjusted from within the toolkit, but significant changes, especially where the age profile has shifted significantly, should be made in the Access Database. Instructions for this are given under Advanced Modifications below. To adjust the populations within the spreadsheet:
 - Enter the new populations in column O. This should be the total number of individuals registered with each practice (or the total number of individuals registered with all practices in each consortia).
 - If any practices/consortia now have zero population, do not enter zero in this column but follow the instructions below about how to omit a practice.
 - Changes to the practice populations made in this manner, will not affect the consortia they constitute, or vice versa.
54. **Updating consortia membership.** If you wish to update the consortia different practices belong to, go back to the *Budget and Consortia Info* sheet and change the names in column C before pressing the update tables button.
55. **Omitting practices/ consortia.** You may want to omit some practices/consortia from the toolkit (rather than just setting their pace of change). This might be because a practice has closed or because you have a specific arrangement with a certain practice/consortia. To do this:
 - Click the down arrow in the corner of cell A25 in either results tab Find the practice code you wish to delete and click the tick next to it, followed by OK. Please note that the list shown will be very long as it includes all practices not just those in your PCT. Remember to update the budget total in cell B3 on the *Budget and Consortia Info* sheet if you need to.¹³ The exclusion of a practice from the practice calculation will not remove it from its consortia for the purposes of this allocation. Neither will the exclusion of a consortia exclude its constituent practices from the practice level allocation.

¹³ For instance, if you are removing a student practice because you are using a local process to set their budget, you will need to subtract this amount from the budget total you had previously entered in the *Budget and Consortia Info* sheet.

Viewing the results

56. The final practice/consortia budgets are given in column AI. However, the toolkit also includes the ability to view practice/consortia budgets graphically (in particular, the impact of different pace of change options).
57. To do this, select either the *PracticeChart* sheet or the *ConsChart* sheet. This shows a funnel plot with populations on the x-axis and the difference between fair shares and historic spend (as in column L on the *Results* sheets). Practices/consortia whose fair share is greater than current spend will be in the upper half of the chart. The orange and red lines are equivalent to a pace of change threshold set to 10% and 25% respectively (for a practice of average size¹⁴) and are meant as a visual aid only. These lines do not change as you adjust the pace of change threshold.
58. The options at the top right of the chart allow you to:
- determine whether practices with issues are highlighted, and whether this is based on having 1+, 2+ or 3+ issues;
 - adjust the pace of change rate and threshold;
 - decide whether the position before pace of change has been applied is shown or not (these are the grey circles on the chart); and
59. The sheet *Issues List 11-12* gives details about potential reasons why some practices may be shown to have spending significantly different from their fair share. The tick box in cell N1 allows you to select between showing all practices in the PCT, or just those that have issues. Note that if you have selected “None” in the *Chart* sheets, then no information will be shown.

Advanced modifications

60. This section of the manual describes how some more detailed changes can be made to the data in the toolkit. It requires Microsoft Access version 2000 or later and assumes some knowledge of that software.
61. Load the database into Access, and if prompted about macros, click enable. The database contains the following tables:

Table name	Description
Acute	The acute per capita fair share indices for each practice in 38 age/sex bands
Inequalities	The variables and index for the DLFE part of the formula
Maternity	The variables and index for the maternity part of the formula
MentalHealth	The variables and index for the mental health part of the formula
Populations	The population of each practice for 36 age/sex bands (and 18 age only bands)
Practices	A list of practice codes and names

¹⁴ So you will see that the orange and red lines cross 10% and 25% respectively at the point where the x-axis is 6500.

Prescribing	The variables and index for the prescribing part of the formula
ToolInputTable	Contains the totals from each part of the formula. This is the table that the spreadsheet draws data from
Variable descriptions	A list of variable names and descriptions

62. The database also contains a number of queries that convert the variables into fair share proportions. These are:

Query name	Description
Acute calcs	Multiplies the per capita index figures from the Acute table with the populations table and sums the result
Inequalities calcs	Performs the calculations for the DFLE component (70 – DFLE multiplied by the practice population)
Maternity calcs	Performs the calculations for the maternity component
MH calcs (stage 1)	Multiplies the per capita index figures from the MentalHealth table by the populations table
MH calcs (stage 2)	Sums the results of the calculations in stage 1
Prescribing calcs (stage 1)	Performs the first stage of the calculations for the prescribing component
Prescribing calcs (stage 2)	Performs the second stage of the calculations for the prescribing component
ToolInputTable calcs	Draws the fair shares from each of the individual components, along with total population, into the table which feed the toolkit

63. There is a single macro in the database called *calculate all*. **After making any changes to the data in the database, you must run this macro** (which runs each of the queries listed above in the correct order). You are advised to make any changes to the database with the Excel part of the toolkit closed.
64. The following paragraphs describe some of the possible changes that you might want to make to the database.
65. **Updating the practice populations.** The population in the database is drawn from the 2010 ADS and should reflect the position in April 2010. This was the latest available at the time of release but if you have more up-to-date local information you may want to feed this into the toolkit. To do this:
- Open the population table;
 - locate the practices you want to change data for and input the new figures (you can do this manually or using an update query);
 - check that the total for males and females adds up to the total for each age band (e.g. [pop0-4] = [m0-4] + [f0-4]) and that the [poptotal] field is equal to the sum of all the age bands.
 - Update the historic budget/spend for the practice/consortia to estimate what it would have been under the new population. Where there have been very significant changes in practice population size or composition you'll need to be especially

careful when setting budgets, as the historic and fair-share per head may no longer be representative.

- run the *calculate all* macro.

66. **Adding a new practice.** To add a new practice to the database:

- Open each table in turn, add a new row and input the data for the new practice in the new row. For populations you will probably have local information that can be entered. For the other variables, the most appropriate solution will probably be to use an average for other practices in your PCT that have similar characteristics.
- You must ensure that the new practice is added to every table in the database.
- In the population table, ensure that you have entered your PCT code in the relevant column, otherwise the new practice will not show in the toolkit. You must also add the practice to the table *Practices*.
- If the population of other practices in the area has changed then you should also update these. The [nbirth] field in the *Maternity* table contains the number of under one year olds, which may also need to be changed.
- Run the *calculate all* macro.
- Open excel and add the practice , consortia and PCT to Budget and Consortia Info sheet in the next visible row after the existing practices and then press update tables.

67. **Practice mergers.** Where two practices have undergone a simple merger then the recommended approach is not to adjust the toolkit but to sum the figures in the toolkit after the budgets have been calculated.

68. If you have questions about the toolkit that cannot be resolved by you local IT support desk please email the PBC mailbox: pbcc@dh.gsi.gov.uk.

Annex A: additional technical detail on the new acute methodology

69. The research on the new acute methodology was undertaken by researchers from the Nuffield Trust, the Centre for Health Economics at York University, the National Primary Care Research and Development Centre, Health Dialog, the London School of Hygiene and Tropical Medicine, and New York University. We commissioned a feasibility study in 2007 and following an evaluation of that study, commissioned research on the approach used in the 2010/11 toolkit in spring 2008. The resulting report *Developing a person-based resource allocation formula*¹⁵ sets out the methodology used and key findings of the analysis. The toolkit has since been updated to use more recent needs data 2007-2010 to produce the acute component of the allocations formula for 2011/12
70. The core approach of the model is the same as that used in the current PCT allocation formula (the CARAN formula), which is to use a regression to explain and predict costed activity. The main differences from the current PCT allocations formula are:
- the unit of analysis is the individual, and not averages from a small geographic area or practice;
 - the explanatory variables include information on the previous diagnoses of individuals.
71. The variables the researchers considered include:
- 38 individual age/gender categories
 - **Attributed needs variables:** 63 CARAN type variables from the Census, Index of Multiple Deprivation domains, etc., recalculated and linked via LSOA; 14 further LSOA level needs variables eg air quality; practice QOF prevalence rates linked via practice; and 53 ONS LSOA type indicators eg “Multicultural suburbia”, “Urban terracing”.
 - **Morbidity:** diagnostic information from 2005/6 & 2006/7 HES records to explain expenditure in 2007/8: 22 ICD10 chapters, 152 ICD10 categories (as used by Information Centre to group HES admissions), 281 ICD10 groups, 70 Hierarchical Conditions Classification groups (used by Medicare), 185 Augmented HCC groups, and 260 Clinical Classification Software groups.
 - **Supply:** 19 CARAN variables (updated and attached at LSOA level eg median waiting time for patients from LSOA); 36 QOF quality achievement at practice level eg stroke care quality; 30 practice characteristics (eg list size, nos GPs); 29 access to facilities measures, (gravity modelled eg number of dedicated day case theatres); 22 access measures (adjusted for local populations); and 151 PCT dummies.

¹⁵ www.nuffieldtrust.org.uk/uploadedFiles/Projects/Developing_a_person-based_resource_allocation_formula_REPORT.pdf?n=6255

72. HES data is used as the source of the morbidity classifications used in the model. Counts or measures of the quantity of activity are not used as these could have led to incentives for unnecessary treatment.
73. The regression coefficients were taken from the previous years model and updated with the latest morbidity data. were estimated using Ordinary Least Squares (several other options were evaluated). The format of the final regression was as follows:

$$c_{ijpt+1} = \beta_0 + x'_{ijpt} \beta_x + m'_{ijpt-1} \beta_m + n'_{ijpt} \beta_n + s'_{ijpt} \beta_s + PCT'_{pt} \beta_{PCT} + \varepsilon_{ijpt+1}$$

where:

- c_{ijpt+1} is expenditure in year $t + 1$ on patient i who is in practice j located in PCT p . The final regression uses 2007/8 HES expenditure data (including inpatient, outpatient, regular attenders and critical care) with each individual assigned to the practice that they were registered with at 1 April 2008.
 - x'_{ijpt} is a vector of individual characteristics (age and gender dummies).
 - m'_{ijpt-1} is a vector of morbidity characteristics based on ICD codes (152 morbidity markers from HES finished consultant episodes).
 - n'_{ijpt} is a vector of attributed needs variables: social rented housing, Disability Living Allowance claimants, adults with no qualifications, asthma prevalence, ONS area mature city professionals, proportion of students, and whether had private episode.
 - s'_{ijpt} a vector of supply characteristics: accessibility score for acute provider capacity, stroke QOF achievement, practice list size.
 - PCT'_{pt} a vector of PCT dummy variables
 - ε_{ijpt+1} is an error term assumed to be independently and identically distributed.
74. The model was estimated on a 10% sample of individuals, and validated on another 10% sample of individuals and a 10% sample of practices. The R^2 at practice level was 77%.
75. To calculate the values for each practice, the process is:
- Calculate the value of the explanatory variables for each individual registered in that practice.
 - The value of the explanatory variables are then aggregated into one of 38 age/sex groups.
 - The average per capita expected cost (in £s) are then calculated by multiplying the explanatory variables by the coefficients from the model. There is then an average per capita expected cost (in £s) for each age/sex group. (These are the figures given in the table Acute in the database part of the toolkit.)
 - These per capita values (in £s) are then multiplied by the number of people in each age/sex group. The estimates of the number of people in each age/sex group are taken from the latest available population data (April 2010) drawn from the

Attribution Data Set (Exeter System)¹⁶. This gives the total expected costs (in £s) for each age/sex group. (This is the calculation undertaken by the query *acute calcs* in the database part of the toolkit.)

- The values of the 38 age/sex groups are then summed to give a practice total.
76. The relative proportion that a practice has of a PCT's total is then used within the toolkit as the proportion of the acute budget for that practice.
77. Because of the size of the dataset (approx 5800 variables for each practice) we have not published the age/sex/practice values of the explanatory variables alongside the toolkit. However, they are available to PCTs on request. Confidentiality clauses and exclusions may apply.

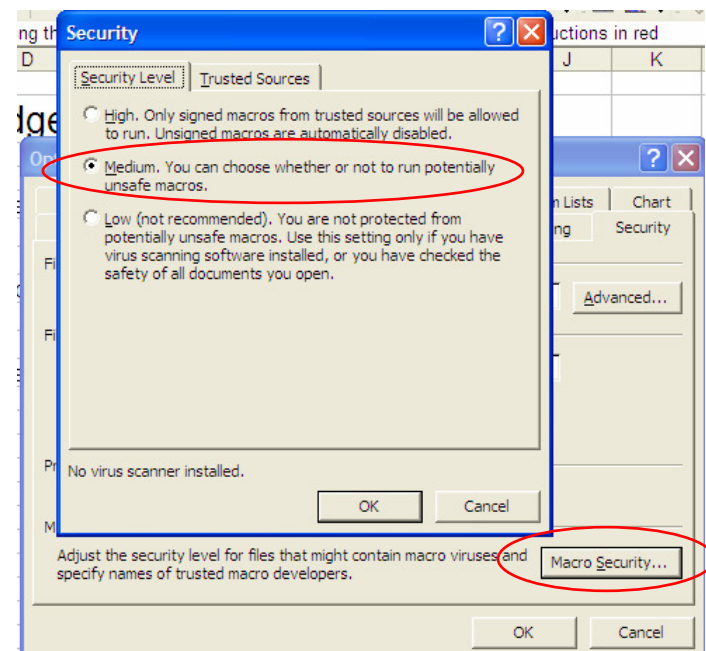
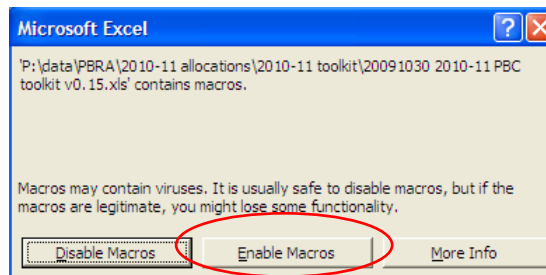
¹⁶ The process ensures that the latest available estimates of need, as at April 2009, are applied to the population at April 2010 and thereby taking account of changes in the population size and profile of each practice.

Annex B: Frequently Asked Questions

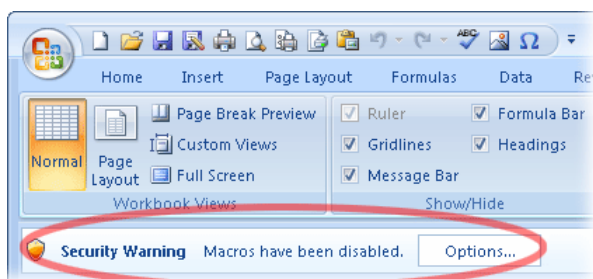
This annex lists some of the common questions that arose during the testing of the toolkit, or following last year's toolkit release.

Nothing happens when I change PCT from the dropdown list. / How do I enable macros? / How do I enable links to external data?

In Excel prior to version 2007, macro security is set to medium by default. When you open the toolkit you will be presented with the following dialog box, and you must click Enable Macros for the toolkit to work.



If you are not presented with this box, and the toolkit does not work correctly, macro security may be set to high. To lower macro security, go to the Tools menu and then click Options. Under the Security tab click Macro Security. Select Medium and then close the two dialog boxes by clicking OK. You will then need to reload the toolkit without closing excel



In Excel 2007 you may be presented with a bar at the top of the spreadsheet indicating that macros have been disabled (it may also say that active content has been disabled). You should click the options box and then enable macros in the dialog box that appears. If this box also says that links to external content has been disabled, this must also be enabled. You will then need to reload the toolkit

without closing excel.

The toolkit will not be able to load the data from the Access database if you do not enable both macros and access to external data.

We have agreed to move all practices to fair shares. How do we do this in the toolkit?

There are two options:

- Use the figures in column Q which show the budget at fair shares, rather than column AI
- Set the pace of change threshold to 0 and the pace of change to a large number (1000%). Column AI should now be the same as column Q, and the charts will show all practices on the zero line.

Does the mental health part of the formula take into account / include community mental health activity?

Yes, the mental health component covers both hospital and community mental health services as the formula is based on data from the Mental Health Minimum Dataset.

Can I adjust the weights given to each of the components? Can I exclude one of the components from the budget?

Yes, it is possible to do either or both of these things. The weights used are in cells C22:G22 of the *Results* sheet in the toolkit. To change the weights (including setting any of them to zero), just enter the revised percentages in this range. Note that you must ensure that the total of the proportions sum to 100%.

Annex C: Variables used in formulas

78. The sections below provide details of the variables used in each components of the model. Information on how they are combined to generate overall need are contained within the queries in the database part of the toolkit and the relevant research reports.

Acute component

Variables	Source
38 age/sex bands: <1, 1-4, 5-9 , 10-14, , 85+ for males and females	Attribution dataset April 2010
152 morbidity markers based on grouped ICD-10 diagnoses fields in inpatient episodes	Hospital Episode Statistics 2008/9 and 2009/10 at individual level
Whether the person had a private inpatient episode	Hospital Episode Statistics 2008/9 and 2009/10 at individual level
Persons in social rented housing	2001 Census attributed from LSOAs to practices using 2010 ADS
All disability living allowance claimants	DWP 2005-2007, attributed from LSOAs to practices using 2010 ADS
Persons aged 16-74 with no qualifications (age standardized)	2001 Census, attributed from LSOAs to practices using 2010 ADS
Mature city professionals	2001 Census Area Classification, attributed from LSOAs to practices using 2010 ADS
Proportion of students in population living away from home	2001 Census, attributed from LSOAs to practices using 2010 ADS
Asthma prevalence rate	Quality and Outcomes Framework, 2009/10

This table does not show supply variables included in the model

Maternity component

Variables	Source
Estimated number of births (babies age <1 currently registered)	Attribution dataset April 2010
Proportion of birth that are low weight	ONS 2001-2005, attributed to practices using 2010 ADS
Mean house prices for all dwellings	ONS 2005, attributed to practices using 2010 ADS

This table does not show supply variables included in the model

Mental Health component

Variables	Source
38 age/sex bands: <1, 1-4, 5-9 , 10-14, , 85+ for males and females	Attribution dataset April 2010
Proportion claiming Incapacity Benefit or Severe Disablement allowance with a mental health diagnosis (working at model only)	DWP 2008, attributed from LSOAs to practices using 2010 ADS
Standardised Mortality Rate where a mental	ONS 2001-2008, attributed from LSOAs to

health (excluding dementia) diagnosis indicated (working age model only)	practices using 2010 ADS
Proportion black ethnic group (working age model only)	2001 Census, attributed from LSOAs to practices using 2010 ADS
Standardised Mortality Rate where a mental health diagnosis indicated (older adult model only)	ONS 2001-2008, attributed from LSOAs to practices using 2010 ADS
Proportion age 60+ that are single pension credit claimants (older adult model only)	DWP 2008, attributed from LSOAs to practices using 2010 ADS

This table does not show supply variables included in the model

Prescribing component

Variables	Source
38 age/sex bands: <1, 1-4, 5-9 , 10-14, , 85+ for males and females	Attribution dataset April 2010
ASTRO-PU's for 18 age/sex bands	2009 version
Low Income Scheme Index	2008, NHS Information Centre
Proportion of those over age 75 who are over age 85	Attribution dataset April 2010
Proportion of people over age 70 claiming Disability Living Allowance	DWP 2008, attributed from LSOAs to practices using 2010 ADS
Standardised Mortality Rate (all ages)	ONS 2004-2008, attributed from LSOAs to practices using 2010 ADS
Generalised Fertility Rate	ONS 2004-2008, attributed from LSOAs to practices using 2010 ADS
Age standardised QOF Coronary Heart Disease prevalence	Quality and Outcomes Framework, 2009/10
Age standardised QOF Diabetes prevalence	Quality and Outcomes Framework, 2009/10
Age standardised QOF Hypertension prevalence	Quality and Outcomes Framework, 2009/10

This table does not show supply variables included in the model

DFLE formula

Variables	Source
Disability Free Life Expectancy	ONS 1999-2003, attributed from MSOAs to practices using 2010 ADS