

Finance and Resources Committee, 10 September 2013

Mazars' report on the HCPC financial model used for forecasting registrant revenue

Executive summary and recommendations

### Introduction

Following the recent discussions at the Council on 4 July and the Finance and Resources Committee on 18 July 2013, the Chief Executive commissioned our Internal Auditors Mazars to review the two key operational and financial models used by the Health and Care Professions Council (HCPC) to forecast revenue derived from registrants and prospective registrants.

The process adopted by Mazars was in essence for them to build their own model using the assumptions used by the HCPC. This majority of the work was undertaken overnight in India, allowing for a rapid delivery of the exercise in eight working days. The two models were then reviewed and any discrepancies were identified as separate comments for further clarification, examination or correction. There were a total of 68 comments. None of the comments were graded One, which would have represented a "potential error which may require a material model adjustment". All comments have now been cleared and closed.

The report entitled **HCPC Business Model Review Final Report** from Mazars dated 30 August 2013 is attached as an appendix.

The two following papers at today's meeting of the Finance and Resources Committee, namely the **Registrant Numbers Forecast model** date 30 August 2013 and the **Registrant income forecast 2013 – 18** dated 30 August 2013, have been updated to incorporate the outstanding Mazars' comments.

### FAST Standard model

Mazars in their report made a number of recommendations to the HCPC relating to the future use of "best practices" for constructing financial and operational models. In particular, they drew to the attention of the Executive the existence of an organisation called FAST (see [www.fast-standard.org](http://www.fast-standard.org)), which has drawn-up a set of standards that can be used when undertaking operational or financial modeling.

The Executive has decided to incorporate the FAST standards initially in the registrant numbers forecast model and the Registrant Income forecast and subsequently in other key models such as the operational model used by the Fitness to Practise Department.

## **Decision**

The Finance and Resources Committee is requested to:

- (i) Review and provide feedback on any “Mazars Query” and related HCPC “Client response”.
- (ii) Endorse the decision by the Executive to use the FAST-standards for the design construction and use in key operational and financial models.
- (iii) Provide feedback to the Executive on any further issues of additional actions that need to be implemented.

## **Background information**

The proposed increase in income as a result of a proposed increase in fees was discussed in Council meeting on 4th July 2013 and the Finance and Resources Committee on 18th July 2013.

## **Resource implications**

Internal resources will be required for the implication of the FAST standards.

## **Financial implications**

The work undertaken by Mazars cost approximately £12,000.

## **Appendices**

HCPC Business Model Review Final Report from Mazars dated 30 August 2013.

## **Date of paper**

30 August 2013



FINANCIAL MODEL AUDIT REPORT TO

# **Health and Care Professions Council**

**HPCPC Business Model Review,  
Final Report**

30 August 2013

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*The contents of this report are confidential and not for distribution to anyone other than the addressees of our engagement letter (or as otherwise set out in that letter). Disclosure to third parties cannot be made without the prior written consent of Mazars LLP.*

*Mazars LLP is the UK firm of Mazars, an international advisory and accountancy group.*

# 1 Executive summary

- 1.1. In accordance with our engagement letter (dated 6 August 2013), we have completed our review of the financial models (the “Models”) prepared for the forecasting of registrants revenue of HCPC.
- 1.2. The scope of our review was to carry out certain agreed upon procedures (the “Agreed Upon Procedures”). These procedures were agreed and carried out in order to provide you with a degree of independent assurance that the Models are materially correct in their base case versions (as listed in the table at Paragraph 3.1). The procedures were not designed to constitute a review of the subject matter and we were not obligated, and did not perform, any procedures beyond those specified.
- 1.3. The Agreed Upon Procedures were to:
  - a. undertake software testing (mapping inconsistencies, hardwired constants, references to blank cells and unused inputs);
  - b. shadow model the key workings of the Models (in one integrated model) to compare the results produced;
  - c. limit the review time to eight working days.
- 1.4. Following our first review we raised the comments highlighted in Section 4 of this report and updated these after two further iterations of review – eight working days of review is now complete.
- 1.5. Having completed the Agreed Upon Procedures all of the queries raised have been answered and have been cleared on the basis set out in our detailed comments at Section 4.
- 1.6. On the basis solely of the Agreed Upon Procedures review and the responses received to our comments, we are not aware of issues with the computational correctness of the Model or any material errors. It should be noted that this affirmation applies only to the base case of Iteration 4 of the Models as listed at Section 2.1 of this report.
- 1.7. In accordance with our scope of work, we have compiled a list of observations in relation to the Models’ compliance with “best practice” (these are listed at Section 5) and also recommendations with respect to further development of the Models, in summary, these are:
  - a. Our agreed upon procedures review has been able to provide a degree of assurance on the current correctness of the Models. Going forward the Models would be labour intensive to update and validate. One option would be to maintain the current Models and institute regular update reviews (of the type we have carried out) when the Models are used to inform decision making. This is unlikely to be cost effective. Our recommended option would be to rebuild the Models using an established modelling standard.
  - b. If the decision is taken to rebuild the Model this could be done by obtaining training from a recognised provider who train modelling to an industry recognised standard. Alternatively, this could be outsourced to an established model builder. We would recommend that before any new model is used for decision making it is subject to a third party review..

## 2 Introduction

- 2.1. In accordance with our engagement letter (dated 6 August 2013), we have completed our review of the financial models (the “Models”) prepared for the forecasting of registrants revenue of HCPC..
- 2.2. The scope of our review was to carry out certain agreed upon procedures (the “Agreed Upon Procedures”). These procedures were agreed and carried out in order to provide you with a degree of independent assurance that the Models are materially correct in their base case versions (as listed in the table at Paragraph 3.1). The procedures were not designed to constitute a review of the subject matter and we were not obligated, and did not perform, any procedures beyond those specified.
- 2.3. The Agreed Upon Procedures were to:
  - a. undertake software testing (mapping inconsistencies, hardwired constants, references to blank cells and unused inputs);
  - b. shadow model the key workings of the Models (in one integrated model) to compare the results produced;
  - c. limit the review time to eight working days.
- 2.4. Following our first review we raised the comments highlighted in Section 4 of this report. We carried out three further iterations of our review and our reporting was organised as follows:
  - a. Issues arising from the review were classified according to importance:
    - 1 – High, e.g., potential error which may require a material model adjustment
    - 2 – Medium, e.g., other potential adjustments
    - 3 – Low, information only, no action required.
  - b. The status of issues were classified as follows:
    - Open – The issue is yet to be resolved;
    - Closed – The issue has been resolved for the purposes of this review.
- 2.5. On completion of our review, and in accordance with our engagement letter, we compiled a short summary of our findings together with commentary on our observations in relation to ‘best practice’ and recommendations for further model development. This can be found at Section 5.

### 3 Model reviewed

3.1. The following Models have been reviewed.

Model	Model file name	Date saved
Iteration 1	BASIC MODEL NO Rf-20130730fQUADCBProjected registrant numbers - 2013-2018	9 August 2013, 14:35
Iteration 1	Income workings - version5	9 August 2013, 14:35
Iteration 2	BASIC MODEL NO Rf-20130730fQUADCBProjected registrant numbers - 2013-2018 - version 2 (after MAzars )	23 August 2013, 16:08
Iteration 2	Income workings - version6 (after Mazars adj)	23 August 2013, 16:08
Iteration 3	BASIC MODEL NO Rf-20130730fQUADCBProjected registrant numbers - 2013-2018 - version with mazars adj2	28 August 2013, 19:16
Iteration 3	Income workings - version8 (after Mazars 2nd adj)	29 August 2013, 12:54
Iteration 4	BASIC MODEL NO Rf-20130730fQUADCBProjected registrant numbers - 2013-2018 - version with mazars adj2	28 August 2013, 19:16
Iteration 4	Income workings - version9 (after Mazars 2nd adj)	29 August 2013, 15:35

3.2. Our review involved the two models listed above. As confirmed by you, we have not reviewed the following two models as listed in our engagement letter: 'Registrant 3/12 or 4/12 revenue re-forecast' and 'Five year plan (the revenue element)'. We have also not reviewed the charts within the two models provided as our review has been focussed on the model calculations.

## 4 Review comments – model logic

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-1	2	Basic Model  'New professions - reg trf 2'!B5  'New professions – register trf'!K11'Number of registrants'!K26:L26	Closed	<p>Number of registrants: In the year 2 forecast, 4610 registrants have been forecast for HMTCM. We understand this relates to 'new professions - register trf' which states 4,500 for the same period. Please confirm 4610 is the correct amount to be used in the calculations and consider linking this cell to the 'Number of registrants' sheet.</p> <p>In addition, the formula for the year 3 forecast (HMTCM) includes the previous year (4610) and also the (4,500) from the 'new professions - register trf' sheet. This has the effect of almost doubling the year 3 forecast. Please confirm this is as intended.</p>	<p>Updated 4500 is the number transferring.</p> <p>Mazars i2: Amendment reviewed and agreed. Comment cleared.</p> <p>Updated Mazars i2: Amendment reviewed and agreed. Comment cleared.</p>
ML-2	2	Basic Model  'New professions - register trf'!E6:H8	Closed	<p>The actual figures in some 'BASIC MODEL' sheets are not used in the Model calculations. For example, 'new professions - register trf'. Please confirm this is as intended and consider linking these to the 'Number of registrants' sheet.</p>	<p>Intended.</p> <p>Want to populate with “actuals” rather than determine by calculation.</p> <p>Mazars i2: Thank you for confirmation. Comment cleared on this basis.</p>



Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-3	2	Basic Model 'UK registrations 2'!B22 'UK registrations'!H21	Closed	Key assumptions for social work graduates suggest 4,450 new social workers initially. However, the input used is 4,395. Please confirm that this is as intended.	Actuals updated. Historic assumption removed.  Mazars i2:  Amendment reviewed and agreed. Comment cleared.
ML-4	2	Basic Model 'International registrations 2'!B22 'International registrations'!K26	Closed	International registrations: Key assumptions state 140 per year additionally. For year 2, only 70 have been applied. Please confirm this is as intended.	Only half a year for this profession to apply (starts Oct not April) so figure cut by 50%.  Mazars i2 :  Thank you for your explanation. Comment cleared on this basis.
ML-5	2	Basic Model 'UK registrations 2'!B25 'UK registrations'!K26	Closed	Key assumptions for HMTTCM through UK registrations route suggest 150 new registrations initially. However, in the period ending 31 March 2016 the assumption taken is 75. Please confirm that this is as intended.	Only half a year for this profession to apply (starts Oct not April) so figure cut by 50%  Mazars i2 :  Thank you for your explanation. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-6	2	Basic Model 'removal'!K27:N27	Closed	There are no written assumptions for PHS removals therefore, please confirm the hardcoded inputs in the referenced cells are as intended.	<p>Year 2 data assumed at 10% for initial removal period. Assumptions updated.</p> <p>Mazars i2:</p> <p>Thank you for the explanation. From the new assumptions we could infer 5% removal in second cycle, whereas the calculations suggest PHS removals as 2.5%, 5% and 2.5% in Year 3, Year 4 and Year 5 respectively. Please confirm that this is as intended.</p> <p>Confirmed (Note PHS Yr 2 &amp; 3 = first cycle; Yr 4&amp;5 = second cycle). Assumptions edited to match your comment.</p> <p>Mazars i3:</p> <p>Amendment reviewed and agreed. Comment cleared on this basis.</p>
ML-7	2	Basic Model UK registrations 2'!B20 'UK registrations'!K11	Closed	UK registrations: The assumption states 4% decrease. However, in year 2, the value for HAD is hardcoded and reflects a 34% decrease. Please confirm this is as intended.	<p>Error corrected</p> <p>Mazars i2:</p> <p>Amendment reviewed and agreed. Comment cleared on this basis.</p>

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-8	2	Basic Model  'International applications'!J21	Closed	Year 1 forecast figures for international applications and international registrations for social workers are hardcoded. This is inconsistent with the formula driven approach for all other professions, which applies a 10% reduction. Please confirm this is as intended.	<p>Intended</p> <p>Social worker INTL applications and INTL registrations determined as 16 per month or 192 per year</p> <p>Mazars i2:</p> <p>Thank you for you explanation. However, while we could find that the international registrations of social workers are hardcoded as 192 the international applications is not hardcoded and is a lower number (189). Therefore applications are lower than registrations (this applies for some other professions) Please confirm as intended.</p> <p>Intended. There is a time lag between application and registration or 6 months to a year or more.</p> <p>Mazars i3:</p> <p>Thank you for your confirmation. Comment cleared.</p>

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-9	2	Basic Model  'International applications'!I6:I21	Closed	The International registrations forecast for the Year 0 budget is the same as the previous actuals period.  Please confirm this is as intended.	Intended  International registrations is reset to the most recent actuals each year end.  Mazars i2:  Thank you for you explanation. Comment cleared on this basis.
ML-10	2	Basic Model  General	Closed	'Grandparent apps' and 'International applications' do not appear to be used in the Model. Please confirm this is as intended and consider removing these sheets if not required.	Used for calculation of scrutiny fees income. Cannot be removed from model.  Mazars i2:  Thank you for you explanation. Comment cleared on this basis.
ML-11	2	Basic Model  'removal 2'!B21:B22  'removal'!I6:N21	Closed	The removal assumptions suggest that 1.5% of registrants are removed when they are not in renewal and 3.81% to be removed when they are in renewal. However, in the calculations of registrant removals 2.5% and 5% are used respectively. Please confirm this is as intended.	Updated to 5% and 2.5% other than small professions.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-12	2	Basic Model  'removal'!I12:N12'remova l 2'!B21	Closed	Further to the comment above, the OT calculations are as follows: 2013/14 (renewal period) - 2.5% 2014/15 (non renewal period) - 2.5% 2015/16 (renewal period) - 5% 2016/17 (non renewal period) - 2.5% 2017/18 (renewal period) - 2.5% 2018/19 (non renewal) - 2.5%  Please review/explain.	Updated.  Two incorrect values in formulas corrected.  5% removals for highlighted values has been used.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-13	2	Basic Model  'Readmissions'!J6:N6  'Readmissions 2'!B20:L21	Closed	The readmission assumptions are unclear (1.25 % of the registrants in the non renewal periods and 2.5% in the renewal periods, but also key assumptions of 0.75% and 1.9%). Please confirm which are the appropriate assumptions and ensure consistency across the sheet. For example, for arts therapists 1% is applied from year 2 forecast onwards.	Assumption updated to 1.25% and 2.25% but percentages have been adjusted to avoid rounding issues when dealing with small professions.  Eg $120 - 3 = 116$ due to rounding or decimals.  Mazars i2:  Thank you for updating the assumptions. However, for arts therapists the readmission assumption applied is still 1% from Year 2 onwards.  Intended, as allows exact whole numbers with %age calculations.  Mazars i3:  Thank you for your confirmation. Comment cleared

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-14	2	Basic Model  'Readmissions'!I21  'Readmissions'!K25:N27	Closed	Readmissions of social workers is hardcoded as 1212 in the budget period 2013/14. HTCTM and PHS readmissions are also hardcoded for all periods. Please confirm that this is as intended.	<p>Intended</p> <p>Hardcoded to avoid referring to exceptional historic 1<sup>st</sup> year values that are inconsistent with the model. Approximation of expected values applied.</p> <p>Mazars i2:</p> <p>The historic values of registrants for social workers start from period 2012/13. Please explain how these are considered exceptional.</p> <p>A much larger than intended number of SW were removed in the first cycle, and readmissions will not follow the usual %age cycle, as many of the removed were deceased or retired. Regular %age do not apply.</p> <p>For HMTCM, the new assumption suggests that 'HMTCM not previously regulated so removal and readmission numbers do not follow model of other HCPC professions initially'. However, we note that the readmission assumption of 2.5% is applied in Year 3 and not in further periods. Please explain.</p> <p>As this is a profession (HMTCM) with no history of rigorous statutory registration, it is assumed that readmission numbers will be initially lower than usual. 1% used.</p> <p>Mazars i3:</p> <p>Amendment reviewed and agreed. Comment cleared on this basis.</p>

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-15	2	Basic Model 'removal 2'!B23 'removal'!M25	Closed	Removal assumptions suggest that HMTCM professional be removed 10% in renewal and 5% in non-renewal periods. However, in 2017/18 which is a renewal period, HMTCM registrants are reduced by 5% instead of 10%. Then in the forecast period 2018/19 removals are 4.5%. Please confirm this is as intended.	Intended  New professions have higher attrition rates at least in the initial year of registration.  10% is value used.  Mazars i2:  Amendment reviewed and agreed. Assumptions have been updated. Comment cleared on this basis.
ML-16	2	Basic Model 'Number of registrants'!L28:M28 'Number of registrants'!L28	Closed	The PHS registrants calculation for the forecast period 2016/17 refers to blank cells for removals and readmissions. This is due to the fact that the sheets are not aligned. Please review.	Cell refs updated, and tables now similar disposition of professions and years.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-17	2	Income Workings 'Fees'!A30 'Fees'!H10:M14	Closed	Fee assumptions in the income workings Model state that fee increase takes place on 1 April of each financial year. We are aware that fees increase dates vary for each profession as shown in the 'renewal periods' sheet. Please confirm that this is an intended modelling simplification.	Assumptions amended and additional assumption inserted.  Mazars i2:  The fee remains same for Year 1 and Year 2, and same for Year 3, Year 4 and Year 5. Please confirm that this is as intended.  This is the intention as the renewal cycles are based on a 2 year cycle. A registrant cannot get a fee rise during their 2 year cycle.  Mazars i3:  Thank you for your confirmation. Comment cleared on this basis.
ML-18	3	Income Workings 'Graduate registration income'!B29:M30	Closed	There are hidden rows for Dance movement therapists and Healthcare Scientists. Please consider deleting these rows if they are not required or please populate for completeness.	Deleted  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-19	2	Income Workings 'Graduate registration income'!D32:M32	Closed	The total of graduate registration income from new professions does not include the income from Public Health Specialists. Please review.	Corrected  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.



Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-20	2	Income Workings 'Graduate Scrunity Income'!H10:H25	Closed	Graduate Scrunity Income calculated for the forecast period 2013/14 refers to an external file (Income reforecast 13-14.xlsx). We have not been provided with this file for review and therefore cannot comment on the accuracy of these inputs. Please confirm your agreement.	Agreed at meeting file not required for review.  Mazars i2:  Thank you for you confirmation. We have excluded from scope.
ML-21	2	Income Workings 'Graduate Scrunity Income'!J29:J32	Closed	Graduate Scrunity Fee for PHS is calculated on the fee input for the previous period. Please review.	Corrected for correct period.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-22	2	Income Workings 'Grand- parenting'!J29:M32	Closed	Graduate scrutiny fee is charged on HMTCM registrants through the grand parenting route. Please confirm that this is as intended.	Corrected so calculated for grand-parenting fee.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-23	2	Income Workings 'International'!I21:J22	Closed	In the calculation of international income for the forecast period 2014/15, the calculation of 'Prosthetists & Orthoptists' refers to the 'Practitioner Psychologists' registrant numbers. Similarly the 'Practitioner Psychologists' refers to the 'Prosthetists & Orthoptists' registrant numbers. Whilst this does not impact the fees in total it may be misleading. Please review.	Corrected  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-24	3	Income Workings 'International'!I10:M29	Closed	In the 'International' sheet, the Grandparenting fee is applied to all professions except arts therapists. Whilst the Grandparenting scrutiny fees are the same as the international scrutiny fees, please consider amending the formula for clarity.	Corrected to link to the international fee.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-25	2	Income Workings 'Readmission'!H28:M29	Closed	The assumptions for readmissions income suggests that "The fee is not payable if the registrant applies to re-join the register within 4 weeks of being removed" and that "50% apply within 4 weeks". The 50% has not been applied to the 'new professions'. Please confirm this is as intended.	Applied to new professions.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-26	2	Income Workings 'Readmission'!H29:M29	Closed	Readmission income on PCS is calculated by using the prior period fees. Also, the calculation refers to the removals sheet instead of readmissions. Please review.	Corrected.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-27	2	Basic Model INTL Registration cycle'!D167:O167  'INTL Registration cycle'!D165:O165	Closed	The 'MEAN' calculation of PYL registrants divides by 3 in some periods and 4 in others. Please confirm this is as intended.	Intended  This reflects when professions were new and so historic data did not cover a complete 5 years for mean calculation purposes.  Mazars i2:  Thank you for your explanation. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-28	2	Basic Model INTL Registration cycle'!D206:O206INTL Registration cycle'!AK204:DD204	Closed	The calculation for monthly weighting of social worker registrants is hardcoded as 83% in each month. It appears that intention was to make it 8.33% (1 / 12) for each month equally. Please review.	Calculation corrected. (Cell references corrected.)  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-29	2	Income Workings ‘Current Renewal No"s"!D10:H10 ‘Current Renewal No"s"!D15:H15	Closed	Values relating to 'Prior year's Graduates taking discount' and 'Graduates no longer are taking a discount' refer to external files and therefore we cannot comment on the accuracy of these figures. Please confirm your agreement.	Agreed.  Mazars i2: Thank you for your confirmation. The limitation of our review is noted.
ML-30	2	Income Workings International Renewal'!D9:R27	Closed	Please explain the basis of the approach for the calculations of 'International renewal' as this is unclear from the Model workings.	Explained with Emma at meeting on 22/8.  Mazars i2 :  Thank you. We have written a narrative based on our review of model workings – this can be found at Appendix A. Please confirm this is consistent with your understanding.  Mazars i4:  We have accepted your amendments to this narrative and confirm its consistent with our understanding. Comment cleared on this basis.
ML-31	2	Income Workings Current Renewal No"s"!D121:H121	Closed	‘Deregistered numbers for 'PO' refer to the same cell for all periods. This is due to anchoring in the formula. Please review.	Corrected.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-32	2	Income Workings Current Renewal No"s"!L155	Closed	Renewal income (HP) is hardcoded as nil for the period 2015/16. Please confirm that this is as intended.	Correct – only 3 months’ worth of income is recognised for HP in 2015/16.  Mazars i2:  Thank you for your explanation. Comment cleared.
ML-33	2	Income Workings Current Renewal No"s"!K164:O164	Closed	The PHS renewal calculation uses the renewal fraction for HAD. Please review.	Corrected to use PHS fraction.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-34	2	Income Workings Current Renewal No"s"!K164:L164	Closed	Calculation of renewal income for Public Health Scientists refers to blank cells in the first 2 forecast periods. Please review.	As per ML-32.  Mazars i2 :  Although the income is not recognised for these periods, please consider updating the formula for consistency.  Done.  Mazars i3 :  Amendment reviewed and agreed. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-35	2	Basic Model  'Number of registrants'!K28:N28	Closed	<p>The calculation of PHS in 'Number of registrants' sheet is inconsistent over the forecast period.</p> <p>For example, PHS forecast for 2016/17 does not consider new profession registrations and PHS forecast for 2018/19 does not consider Grand parenting registrations.</p> <p>Furthermore, the formula appears to sum through the sheets for the previous period rather than the current period. Please review.</p>	<p>Done, updated.</p> <p>Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.</p>
ML-36	3	Basic Model  'Number of registrants'!C26:J30 'International applications'!C30:J30	Closed	<p>The referenced cells are blank. Please consider populating for consistency and to ensure that changes in the Model elsewhere will flow through correctly.</p>	<p>These are not '0' values, but reflect time when these professions were not viable for reporting purposes. '0' =/= '-'.  Mazars i2:  Thank you. Comment cleared.</p>

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-37	2	Basic Model  'New professions - register trf'!C13:N13 'International applications'!C26:K30 removal!C29:H29 Readmissions!C29:L29 'UK registrations'!C30:J30 'Grandparenting registrations'!L23:N23 'Grandparent apps'!L23:N23 'rmed registrants less readmis'!C29:J29	Closed	The formula in the referenced cells is not consistent across all periods. Please consider updating the formula for consistency. We note in particular that some values for PHS and HMTCM are omitted from the total calculation (Readmissions sheet). Please review.	HCPC are using '- ' to indicate not viable, and '0' where none recorded or predicted were is viable solution.  Mazars i2: Thank you for your explanation. While not best practice, cleared for the purposes of this review.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-38	3	Basic Model  'New professions - register trf'!Q13  'INTL Application cycle'!R4:S4  'INTL Registration cycle'!R4:S4  'Number of registrants'!G41:N45	Closed	The referenced cells are not used in the Model calculations and are considered memo cells. Please consider removing if they are not required.	Removed. Completed.  Mazars i2:  Amendment reviewed and agreed. However, memo cells referenced on 'INTL Registration sheet' are not removed.  Apols, must have lost change. No removed again.  Mazars i3:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-39	2	Basic Model  'UK registrations'!K11  'UK registrations'!I21:K21  'International applications'!J21  'Grandparenting registrations'!K26:N28	Closed	There are a number of cells within calculation blocks that are hardcoded. Examples of these are referenced here. Please confirm this is as intended and if so, consider linking them to an input sheet or highlighting them as 'input' cells.	Highlighted in pale blue colour.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-40	3	Basic Model removal!K25:N25	Closed	The referenced cells include hardcoded values which differ between periods due to varying assumptions. Consider linking the formula to a labelled input for clarity and to ensure that if assumptions change, the calculations are automatically updated.	Will be implemented in future. Not this iteration.  Mazars i2:  Thank you for your confirmation. While not best practice, closed for the purposes of this review.
ML-41	3	Basic Model  'Grandparent apps'!C32:N32	Closed	The 'grand total' in the 'grandparent apps' sheet refer to the 'grandparenting registrations' sheet rather than being the sum of the above rows. Please consider amending for consistency.	Completed.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-42	3	Basic Model  'EU Temp or occnl'!C6:N31	Closed	There are a number of sheets that do not appear to be used in the Model. Examples of these are:  - EU Temp or occnl -removed registrants less readmis - 2 year registration cycle by pr  Please consider removing if not required.	The sheets referred to are used by the Council to form a complete model. They should not be removed.  Mazars i2:  Ok, Noted. These have not been reviewed.



Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-43	3	General	Closed	There are external links within the Models. Please consider removing these links to avoid issues with the Model not updating appropriately. We can discuss alternative approaches with you.	<p>Removed for Basic Model.</p> <p>Mazars i2: Amendment reviewed and agreed. Please also consider a similar approach for 'Income Workings' model.</p> <p>Income model now links to basic model and also income reforecast and graduate income forecast only.</p> <p>Mazars i3: Comment cleared on this basis.</p>
ML-44	2	Income Workings  'Total Income by profession'!H30:M30	Closed	The formulas in the referenced cells are inconsistent. Please review/amend.	<p>Corrected.</p> <p>Mazars i2: The calculations still appear to be referring to blank cells. Please review.</p> <p>Corrected in D30 to H30. No effect on total income as cells equal nil.</p> <p>Mazars i3: Amendment reviewed and agreed. Comment cleared on this basis.</p>

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-45	2	Income Workings  'Total Income by activity'!D27:D32  Total Income by profession!I29:M29	Closed	The referenced cells appear to be linking to blank cells or incorrect sheets. Please review.	Corrected.  Mazars i2:  The calculations still appear to be referring to blank cells. Please review.  Correct, as formula based on percentage increase therefore as there is no income for 2009/10 no calculation required.  Mazars i3:  Not updated but doesn't impact model results. Cleared on this basis.
ML-46	2	Income Workings  'Renewal Income'!I18  'Renewal Income'!L17:M17  'Renewal Income'!A36	Closed	The formula provided at the bottom of the sheet suggests that renewal income should consider "renewal income + international renewal". The calculation of 'Orthoptists' and 'Operating Departmental Practitioners' in the referenced cells do not include international renewals. Please review.	Corrected.  Mazars i2:  Amendment reviewed and agreed. Please update the similar calculation for the Orthoptists profession in period 2014/15.  Now corrected for Orthoptists  Mazars i3:  Amendment reviewed and agreed. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-47	3	Basic Model  'UK registrations'!I6:N21 'International applications'!J6:N21 'International registrations'!J6:N21 removal!I6:N25 Readmissions!E6:N21	Closed	Hardwired constants are included in various formulae within the Model. Please consider linking these to inputs for clarity.	May implement in next major iteration, as sensible suggestion.  Mazars i2: OK, Noted. Cleared for the purposes of this review.
ML-48	3	Income Workings  'Current Renewal No's'!I16 'Current Renewal No's'!I15	Closed	The renewal fractions applied are hardcoded. Please consider linking these to inputs for clarity.	These fractions are based on number of months and will not change.  Mazars i2: OK, Noted, cleared for the purposes of this review..
ML-49	2	Income Workings  'Total Income by profession'!H34:M34	Closed	The calculation of 'income % increases' refers to the sub total rather than the total. Please confirm this is as intended.	Amended.  Mazars i2:  Amendment reviewed and agreed. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-50	3	Basic Model  General	Closed	Ensure similar tables have the same position in each sheet.	Implemented for all except new professions.  Mazars i2:  Changes reviewed and agreed. Please consider applying same approach in the 'EU Temp or occnl' sheet.  Agreed. Completed  Mazars i3:  Changes reviewed and agreed. Comment cleared on this basis.
ML-51	2	Income Workings  'Total income by profession'  'Total income by activity'	Open	Create a check to ensure both cuts of results (profession and activity) give the same answer.	Corrected.  Mazars i2:  Amendment reviewed and agreed.
ML-52	2	Basic Model  UK registrations'	Closed	UK registrants for every profession are decreased by 14% in the Year 0 (Reforecast). The assumption suggests 4% decline in all professions except social workers. Please confirm that this is as intended.	An additional 10% fall in UK applications is predicted (14% in total) for most UK applications in the budget year)  Mazars i3:  Thank you for confirmation. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-53	2	Income Workings Renewal Income!'H28:M29	Closed	International Renewal are not added in the calculation of total renewal income for the new professions. A similar approach is been followed for all the other professions. Please confirm that this is as intended.	Now corrected  Mazars i3:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-54	2	Income Workings  Current Renewal No"s"!D159:H160, D168:H169	Closed	The calculation of renewals carried forward in each period for HMTCM and PHS professions refers to blank cells instead of referencing the removals and re-admissions. Please amend for model accuracy.	Corrected  Mazars i3:  Amendment reviewed and agreed. Comment cleared on this basis
ML-55	2	Income Workings  Current Renewal No"s"!F164	Closed	PHS balance brought forward for the period 2016/17 is linked to 'New professions - register trf' sheet in the basic model, Ideally it should refer to closing balance for the period 2015/16. Please explain.	Corrected to link to the b/fwd figure.  Mazars i3:  Amendment reviewed and agreed. Comment cleared on this basis.
ML-56	2	Income Workings  International!'J29	Closed	International Income from PHS is calculated on PHS international registrations instead of international applications which is the case with rest of the professions. Also, it refers to previous periods fees. Please comment on the different approach followed.	Corrected to link to the international applications and correct period for fees.  Mazars i3:  Amendment reviewed and agreed. Comment cleared on this basis
ML-57				[BLANK]	
ML-58				[BLANK]	
ML-59				[BLANK]	

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-60				[BLANK]	
ML-61				[BLANK]	
ML-62	2	Income Workings International Renewal!D17:E17	Closed	For 'Operating Departmental Practitioners' profession the renewal date is Dec'14. We would therefore expect that the number of registrants before renewal date should include the registrants from April 2014 to November 2014. Instead in the Model the registrants for December 2014 are also included in the registrants before renewal date. Please amend.	Corrected Mazars i3: Amendment reviewed and agreed. Comment cleared on this basis.
ML-63	2	Income Workings Current Renewal No"s"!I171:J171	Closed	The renewal date for the profession 'Public Health Scientists' is August 2014. Therefore the renewal fraction period fraction should be $(8 / 12 = 0.67)$ . However, the model uses 0.75. Please confirm if this is the correct approach.	The renewal date for PHS is 1 July 2013, therefore the fraction should be 0.75 (i.e 9/12) Mazars i3: Thank you for amending the date in the model. Amendment reviewed and agreed. Comment cleared on this basis.
ML-64	2	Income Workings Current Renewal No"s"!D167:H167, D129:H129	Open	Radiographers and PHS does not follow the approach of professions with renewal date in 2014 as the workings for these in the 'Current Renewal No's' sheet suggest that they are renewed in 2 years. Please review/explain	Radiographers renewal date is March 2014 (was showing as March 2015 on the current renewal nos sheet.) Therefore they renew the financial year ending 31 March 2014 and are consist with other professions renewing in that financial year. PHS renewal in the next renewal year and are consist with those professions. Mazars i3: Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-65	2	Income Workings International Renewal!G11:H11, D16:E16, D18:R19	Closed	The renewal date for the biomedical scientist is Dec 15. December 15 registrants are included while linking the number of registrants before the renewal date for the forecast year 2015/16 from the BASIC model. This is not consistent with the approach followed in other professions where the month of renewal period is included in the period after the renewal date. Similar inconsistency is found in the following professions as well: - Occupational Therapists - Orthoptists - Paramedics Please explain/ review	Corrected to include from Apr to Nov for BS's, Apr to Aug for OR's and PA's and Apr to Oct for OT's  Mazars i3:  Thank you for the amendment. Please also amend OT, OR and PA throughout the model periods.  Mazars i4  Amendment reviewed. Comment cleared.
ML-66	2	Income Workings International Renewal!D26:R27	Closed	The number of registrants for Healthcare Practitioners and PHS professionals are hardcoded values rather than being linked to the 'BASIC MODEL' which is different from the approach followed in other professions. Please confirm that this is as intended.	Corrected. Now linked to the Basic model: international registrations sheet. As there is no phasing in the basic model regarding the new profession new international registrants, I have assumed that they join the register evenly across the year.  Mazars i3:  Thank you for your explanation. Amendment reviewed and agreed. Comment cleared on this basis.
ML-67	3	Income Workings International Renewal!D28:R28	Closed	The total of the renewal income excludes the income from health care practitioners and PHS registrants. Although this does not affect the model workings, please amend for model completeness.	Amended.  Mazars i3:  Amendment reviewed and agreed. Comment cleared on this basis.

Our ref	Grade	Model ref	Status	Mazars query	Client response
ML-68	2	Income Workings  Renewal Income'!\$J\$18:\$M\$18	Closed	International renewal income calculated on 'International Renewal' sheet for Orthoptists profession is linked to 'Operating Departmental Practitioners' from the year 2015/16 onwards. Please amend.	Mazars i4: Reviewed and cleared.



## 5 Summary findings and best practice commentary

5.1. **Having completed the Agreed Upon Procedures all of the queries raised have been answered and have been cleared on the basis set out in our detailed comments at Section 4.**

5.2. **On the basis solely of the Agreed Upon Procedures review and the responses received to our comments, we are not aware of issues with the computational correctness of the Model or of any material errors. It should be noted that this affirmation applies only to the base case of Iteration 4 of the Models as listed at Section 2.1 of this report.**

5.3. In accordance with our scope of work, we have compiled the following, not necessarily exhaustive, list of observations in relation to the Models' compliance with 'best practice' (we have compiled this based on our wider industry experience noting that there is not industry agreed definition of how 'best practice' should be defined):

- a. Hard coding. This is where constants are introduced into formulae – such hard-coding is hard to identify for model users, limits the Models' flexibility to be used as a dynamic tool and increases the risk of error. This should be avoided and input should be separately identified on a separate "assumptions" sheet.

Examples:

- 1 The % by which the UK registrants (BASIC MODEL) decrease in the forecast periods is hardcoded in each cell.
- 2 Hardcoding for renewal period fraction in the 'International Renewal' sheet for each profession.

- b. Varying logic. There are multiple instances of changes to model logic across a row, this is hard to identify for model users and may lead to error. Every calculation should be based on one formula only, which is copied from left-to-right

Example:

The calculation in the 'International Renewal' sheet of the income workings model is inconsistent due to difference in renewal assumptions. While this reflects the operational reality we would recommend building logic into the model to deal with this rather than changing logic across a row.

- c. Link from external sources: An external reference to another model may produce incorrect results if the model is not updated for changes in the other models. A better approach would be to use different sheets in a single model for all calculations.

Example: Graduate registration income in the income workings model uses the calculations done in different model (Income reforecast 13-14 and Graduate income - V1). If these files are kept in different folders the external links would not be updated.

While we understand this has been done to separate the ‘finance’ and ‘operations’ departmental responsibilities, this is better achieved through password protection or through removal of ‘live links’ between models such that instead inputs sets are passed between departments.

- d. The Models use an excessive number of sheets: Single sheet can be used for summarising the assumption for different workings under different heading rather than using different sheet for each model section, this makes would make the Models easier to “read” and review.

Example: Each sheet in the BASIC MODEL uses a separate sheet for assumptions. All the assumptions can be summarised in a single ‘Assumption’ sheet.

- e. When compiling such an “assumptions” sheet, all assumptions should be fully documented with description and labelling of the units.
- f. It is helpful to clearly identify the timeline at the top of each sheet – and important that the same column is used for each time period (the models are compliant in this regard).
- g. The logic contained within each cell should be simple (the models are mainly compliant in this regard) with logic used from nearby lines for calculations.
- h. The Models would benefit from formatting to indicate separation of inputs, workings and outputs.
- i. The Models would benefit from “check” calculations to confirm model integrity, these can be summarised as a single check on the model “summary sheet”.
- j. The Models should contain an attractive “summary” sheet which gathers together all key outputs for the prospective user. Currently there are a variety of potential outputs spread throughout the Models.
- k. The Models would benefit from more obvious control processes e.g., a sheet detailing incremental changes, version control etc.

5.4. In accordance with our scope of work, we also make the following recommendations in relation to areas for future development of the Model:

- a. Our agreed upon procedures review has been able to provide a degree of assurance on the current correctness of the Models. Going forward the model would be labour intensive to update and validate. One option would be to maintain the current Models and institute regular update reviews (of the type we have carried out) when the Models are used to inform decision making. This is unlikely to be cost effective. Our recommended option would be to rebuild the models using an established modelling standard.
- b. If the decision is taken to rebuild the Model Alternatively, these skills can be obtained in-house from an established training provider who teach an industry recognised modelling standard. Our recommended training supplier would be f1f9 (<http://www.f1f9.com/financial-modelling-training/>) who we ourselves used for training our in-house team and who offer both classroom and online training materials..

Alternatively, the model build could be outsourced to an established model builder. We would recommend that before any new model is used for decision making that it is subject to a third party review

## Appendix A – Understanding of international renewal income calculations

Our understanding of the working of International renewal income calculation on the ‘International Renewal’ sheet:

For the professions which have the renewal dates in 2014:

1. Arts Therapists (Jun'14)
2. Chiropodists (Aug'14)
3. Dieticians (Jul'14)
4. Hearing Aid Dispensers (Aug'14)
5. Operating Departmental Practitioners (Dec'14)
6. Physiotherapists (May'14)
7. Radiographers (Mar'14)
8. Social Workers (Dec'14)
9. Public Health Scientists (Aug'14)

For these professions, a full renewal fee is applied for income calculation on the registrations before the respective renewal dates. (This can be inferred as ‘Registrants pay a full year renewal fee on joining on the register’.)

And, for the total number of international registrants in that particular year (after the renewal date) renewal income is calculated for the renewal period fraction (i.e. the fraction of year, remaining from renewal date to the end of financial year which is in March) on the ‘Current Renewal No’s’ sheet. (so, for example, renewal date for Art Therapists is June 2014. Therefore the renewal period fraction is  $10 / 12 = 0.83$ )

For rest of the professions:

1. Biomedical Scientists (Dec'15)
2. Clinical Scientists (Oct'15)
3. Occupational Therapists (Nov'15)
4. Orthoptists (Sep'13)
5. Paramedics (Sep'13)
6. Practitioner Psychologists (Jun'15)
7. Prosthetics & Orthotics (Oct'15)

8. Speech & Language Therapists (Oct'15)

9. Healthcare Practitioners (Apr'15)

For these professions, a full renewal fee is applied for income calculation on the registrations before the respective renewal dates. (as they pay a full year renewal fee on joining the register). For the total registrants for that particular year renewal fee is charged for the renewal period fraction on the 'International Renewal' sheet itself.

These professions are renewed in a 2 year time span (This can be inferred from the workings on 'Current Renewal No's' sheet where the international registrants are added on a every 2 year i.e. for Biomedical Scientists, international registrants for the year 2014/15 and 2015/16 are added in year 2015/16 and registrants for the year 2016/17 and 2017/18 are added in the year 2017/18 for the calculation of renewals carried forward)

As the registrants are renewed in a 2 years time span, the registrants for the first year are charged with renewal fee according to renewal period fraction until the renewal date on the 'International Renewal' sheet. For example, registrants of biomedical scientists for year 1 (2014/15) are charged with renewal fee in renewal period fraction of 0.66 (8/12) in the Year 2 (2015/16) as the renewal date is December 15.

Registrants who join the register in before the renewal date, of year 2, a full renewal fee is charged for the calculation (as they pay a full year renewal fee on joining the register).

And, for the remaining period of the financial year of Year 2 after the renewal date (from December 2015 to March 2016)the renewal fee on the Year 1 registrants is charged in the 'Current Renewal No's' sheet using renewal fraction ( $4/12 = 0.33$ ).