Wales Centre for Public Policy
Canolfan Polisi Cyhoeddus Cymru

Modelling the Impact of Raising the Age of Participation to 18

Dr. Matt Dickson
Institute for Policy Research, University of Bath
November 2021

Our Mission

The Wales Centre for Public Policy helps to improve policy making and public services by supporting ministers and public service leaders to access and apply rigorous independent evidence about what works. It works in partnership with leading researchers and policy experts to synthesise and mobilise existing evidence and identify gaps where there is a need to generate new knowledge.

The Centre is independent of government but works closely with policy makers and practitioners to develop fresh thinking about how to address strategic challenges in health and social care, education, housing, the economy and other devolved responsibilities. It:

- Supports Welsh Government Ministers to identify, access and use authoritative evidence and independent expertise that can help inform and improve policy;
- Works with public services to access, generate, evaluate and apply evidence about what works in addressing key economic and societal challenges; and
- Draws on its work with Ministers and public services, to advance understanding of how evidence can inform and improve policy making and public services and contribute to theories of policy making and implementation.

Through secondments, PhD placements and its Research Apprenticeship programme, the Centre also helps to build capacity among researchers to engage in policy relevant research which has impact.

For further information please visit our website at www.wcpp.org.uk

Core Funders

Cardiff University was founded in 1883. Located in a thriving capital city, Cardiff is an ambitious and innovative university, which is intent on building strong international relationships while demonstrating its commitment to Wales.

Economic and Social Research Council (ESRC) is part of UK Research and Innovation, a new organisation that brings together the UK's seven research councils, Innovate UK and Research England to maximise the contribution of each council and create the best environment for research and innovation to flourish.

Welsh Government is the devolved government of Wales, responsible for key areas of public life, including health, education, local government, and the environment.

Contents

Summary

- This report quantitatively evaluates the likely impacts on participation and attainment of raising the participation age (RPA) in education or training to 18 in Wales. It complements an accompanying report that reviews qualitative evidence on the value of introducing RPA in Wales (Maguire, 2021).
- Using linked school and further education data for cohorts completing year 11 in 2014 to 2017, the impact of RPA to 18 on participation in year 12 and year 13 is estimated for future cohorts.
- The post-16 education routes for young people who do not currently participate in year 12 and/or year 13 are estimated along with the likely attainments they would achieve from this additional education. The lifetime economic value of these additional attainments is then estimated.
- For accessibility and ease of understanding, we present a central scenario estimate based on what we believe to be plausible assumptions in terms compliance, course choices, attainment and lifetime economic values. However, there remains considerable uncertainty around the assumptions, so we present a range of plausible scenarios and outcomes.
- We find that, based on the central modelling scenario (which assumes 30% compliance), should RPA be implemented in Wales:
  - An additional 3% of a cohort would be participating in year 12 (~900 students) and an additional 6% in year 13 (~1,800 students).
  - The estimated economic value of the additional attainments that these new participants would gain is approximately £36m per cohort, representing a 1.4% increase on the total lifetime value of the qualifications we would expect in the absence of RPA.
- These estimated benefits are particularly sensitive to the degree to which young people comply – we include outcomes for alternative scenarios of 5%-100% compliance.
- The vast majority of the economic benefits of the policy relate to the additional attainments for students who would previously not have participated in year 12 or year 13.
- While RPA formed the basis of the model and its assumptions, the analysis can be used to inform other potential policies that aim to increase participation and engagement in post-16 education or training in Wales (as outlined in Maguire, 2021).

Executive summary

At present, the age of compulsory education in Wales is 16 years old. The Welsh Government asked the Wales Centre for Public Policy (WCPP) to explore the potential impacts of raising the participation age (RPA) to 18 years old. The evidence of the impact of RPA in other countries was reviewed in a recent WCPP report (Maguire, 2021). This work complements that report by estimating the potential impacts on participation and attainment of RPA in Wales, compared to a baseline of expected voluntary participation levels at ages 17 and 18. The lifetime economic value of the additional qualifications obtained by those compelled by the policy to remain in education or training is then estimated.

To aid with the accessibility of the work, we have used a central modelling scenario which makes what we believe are the most defensible assumptions for the levels of compliance with the policy, course choices, the rate of attainments and the lifetime economic value of qualifications gained. However, there remains considerable uncertainty around several of the assumptions and so we present a range of plausible scenarios and their associated outcomes.

The main finding from the central scenario is that for a typical cohort, the policy would induce an additional 900 students to participate in education or training in year 12 and an extra 1,800 in year 13 compared to the estimated voluntary participation. The additional participation would result in an extra:

- 70 students crossing the 5A*-C threshold at GCSE;
- 110 students gaining two or more A-levels;
- 115 students gaining vocational qualifications at level 2;
- 220 students gaining vocational qualifications at level 3;
- 120 students gaining apprenticeships at level 2; and
- 10 students gaining apprenticeships at level 3.

To put this in context, we estimate that amongst those who choose to participate for both years post-16 there would be 11,000 students who gain two or more A-levels and 2,800 who would pass the 5A*-C GCSE threshold. The RPA increases represent a 1.0% increase in the cohort's attainments of two or more A-levels and a 2.5% increase in attainment of the key GCSE threshold.

Increasing compliance from the 30% assumed in the central scenario to 50% would see the number of students attaining 5A*-C GCSEs increase to 125 and the number

gaining two or A-levels up to 245. If, however, compliance was 30% but the attainment rate of RPA students was only 50% of that of comparable voluntary students (as opposed to the 66.7% assumed in the central scenario) then the additional number gaining 5A*-C GCSEs drops to 55 and for two or more A-levels it is 70.

Under the central scenario, the additional economic benefits due to RPA would be approximately £36 million per cohort of young people affected by the policy. The estimated value of qualifications voluntarily gained in year 12 and 13 by a typical cohort is approximately £2.55 billion, thus the RPA would add 1.4% to the cohort's lifetime economic qualifications valuation. The vast majority of the economic benefits of the policy relate to the additional attainments estimated for the group of students who would previously not have participated in either year 12 or year 13. This overall figure considers only the labour market returns to the additional qualifications attained as a result of the policy – it does not take into account the costs of providing the additional education and training, nor the value of any other wider benefits of increased educational participation in terms of health, wellbeing, civic participation and crime.

Moreover, the additional participation, attainment and economic value of RPA to 18 will vary considerably depending on factors such as the way in which the policy is implemented, the support given to the additional participants, and the extent to which the affected young people engage with the requirements of the policy. Varying the degree of compliance in our model sees the economic value increase from £36m for 30% compliance, up to £70m if compliance is at 50%. On the other hand, lower compliance of 15% would suggest a valuation of only £17m. Alternatively, keeping compliance at 30% but lowering the attainment rate to 50% would suggest a value of £25m for the additional attainments associated with this set of assumptions. In all models, the analysis suggests that failing to provide the young people who will be affected by the policy with options that attract them to remain in education or training would result in negligible additional attainments and commensurately small economic benefits. It may also impact on their future motivation to participate in learning.

The estimates from the modelling are not restricted to the introduction of RPA, but rather show the effects of increased participation. This means that the results will be relevant for both RPA and for other policies that aim to encourage participation and engagement in post-16 learning, and/or reduce early school leaving (see Maguire, 2021 for more information on the evidence relating to these topics).

Introduction

Of the 30,602 young people completing year 11 in 2017, 92% participate in education or training in the following academic year (year 12) and 82% participate in education or training in the year after that (year 13). As such, there is potential for a non-trivial number of young people to be affected by any change in policy that aims to increase participation in education or training, particularly in year 13. The RPA policy, as has been implemented in England, is distinct from previous education expansion policies such as the 1947 and 1972 Raising of the School Leaving Age (RoSLA) which mandated compulsory additional years of education in secondary school. RPA is broader: the additional education or training could comprise full-time study in a school or college, or with a training provider, but could also be full-time work or volunteering (20 hours per week or more) combined with part-time education or training (approximately one day per week[1]), or an apprenticeship or traineeship.

In order to estimate the additional value of increased participation driven by RPA, this report models the potential effect of the policy in four stages:[2]

1. modelling the impact of the policy on participation in year 12 and year 13;
2. modelling the course choices made by the additional participants;
3. modelling the attainments by the end of year 13 of the additional participants; and
4. estimating the lifetime economic value of these additional attainments.

The impact that RPA could generate depends primarily on the degree to which those who would not otherwise have chosen to remain in education or training beyond the end of year 11 (age 16) comply with the policy, the courses they choose, and the extent to which they achieve the additional qualifications undertaken. The modelling process therefore requires a number of assumptions to be made concerning:

1. the level of compliance with the policy;
2. the choice of course students would make – given their first choice is to leave education and training;

[1] The statutory requirement is that part-time education or training pursued alongside full-time work must involve 280 planned qualification hours per year leading towards relevant regulated qualifications.

[2] The modelling approach here broadly follows the approach taken in Hunt and McIntosh (2007) who estimated the potential impact of raising the participation age to 18 in England.

3. the rate of attainment these students would achieve on their chosen courses; and
4. the lifetime economic value that these additional qualifications would confer.

Based on the research literature and particularly the qualitative evidence in this area (see Maguire, 2021), we have chosen what we believe to be the most plausible assumptions in each of these four areas to provide a central scenario estimate. However, in light of the fact that the evidence base itself is limited and there remains a substantial degree of uncertainty around some of the model parameters, we later present a range of plausible alternative scenarios in which the underlying assumptions are varied. This provides a range of plausible outcomes of the policy. The realised outcome would depend in part on the way in which the policy is implemented, other supporting policies potentially introduced, and how this determines the parameter values in each of the areas where we have to make modelling assumptions.

The modelling stages and the assumptions for each are summarised in Figure 1 – further detail on how these assumptions were arrived at are given in the sections below.

Figure 1: Modelling stages, underlying assumptions and assumptions chosen for the central modelling scenario

	Stage 1	Stage 2	Stage 3	Stage 4
Modelling stages	The impact of the policy on **participation** in year 12 and year 13	The **course choices** made by the additional participants	The **attainments** by the end of year 13 of the additional participants	The **lifetime economic value** of these additional attainments
Assumptions	The level of **compliance** with the policy	The **choice of course** students would make	The **rate of attainment** these students would achieve on their chosen courses	The **lifetime economic value** that these additional qualifications would confer
Central scenario	**30%** compliance	Qualification route distribution: **as per comparison group** Percentage of jobs becoming apprenticeships: **25%**	Attainment rate: **66.7%**	Economic valuation of qualifications compared to voluntary participants: **50%**

Central modelling scenario

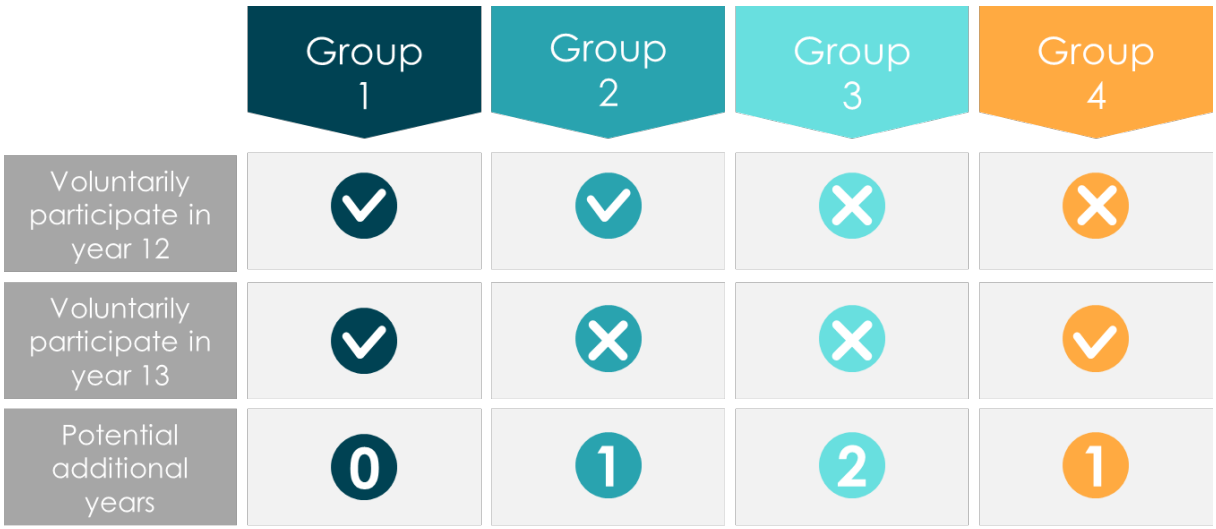
Stage 1: Modelling additional participants

The starting point for modelling the potential impacts of RPA in Wales is to estimate the impact of the policy on participation in education or training.[3] Students currently fall into four possible groups in terms of what they choose to do post-16:

1. Participate in education/training in both year 12 and year 13;
2. Participate in year 12 but not year 13;
3. Participate in neither year 12 nor year 13; or
4. Exit education/training in year 12 but return to participate in year 13.

As such, the potential impact of the policy of RPA to 18 can be summarised as shown in Figure 2.

Figure 2: Possible post-16 participation groups and potential policy impact

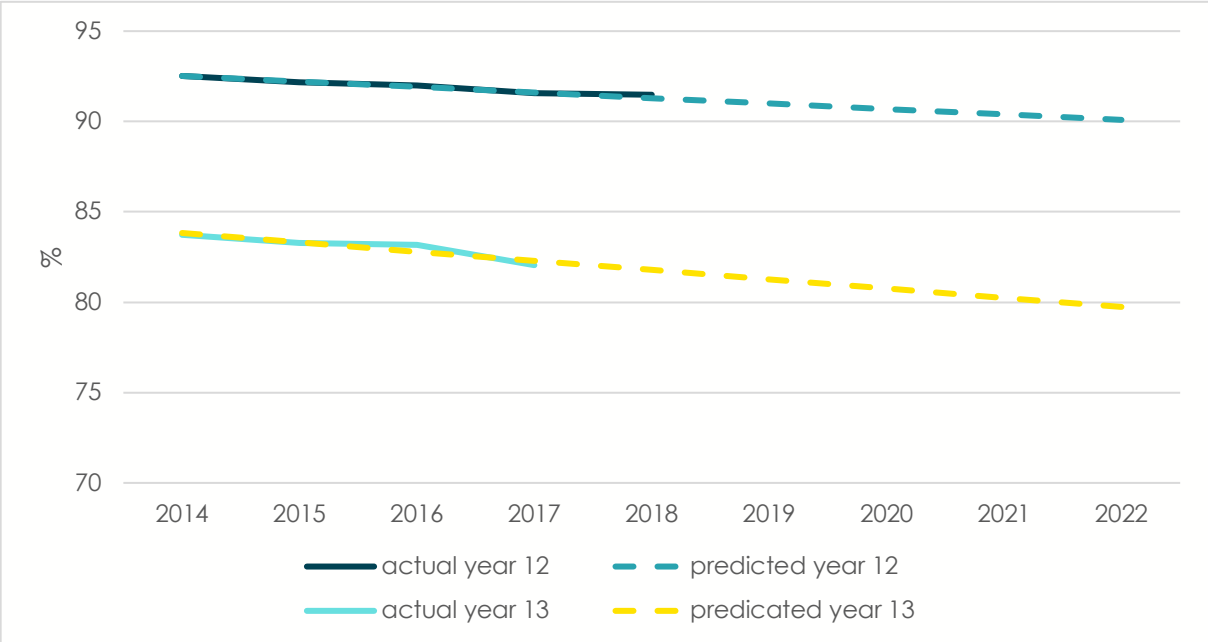


[3] The basis for the modelling approach and discussion of alternative approaches is set out in the methodology section in the Annex.

In order to model the additional participants resulting from the policy, we need to first estimate the distribution of students across these four groups in the absence of RPA. In particular, we need to estimate the number of students who would, through choice, be in groups 2, 3 or 4 (i.e. those who would choose not to complete both year 12 and year 13). To do this we examine the trend in participation observed over recent cohorts and specifically the distribution of students across the four groups.[4]

Figure 3 shows the recent participation rates for cohorts defined by the year in which they complete Key Stage 4 at age 16 – that is, the year that they finish compulsory schooling with most taking their GCSE examinations.

Figure 3: Actual and predicted participation in year 12 and year 13 by KS4 cohort



As can be seen in Figure 3, participation in each year has been largely stable for the four cohorts who completed KS4 in 2014-2017. These are the most recent cohorts for whom we know their activity and attainments in both year 12 and year 13. Participation in year 12 has consistently been 91%-92%, though on a slightly downward trend, while participation in year 13 has been 82%-83%, again on a slightly downward trend. Using a linear regression model[5] we can use the observed

[4] Throughout the analysis we are using data from the Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record. Full details of the years used are in the Annex.

[5] A linear regression model is estimated on data from cohorts completing KS4 from 2014 to 2017, with just a linear time trend. Allowing a more flexible quadratic time trend made negligible difference to the predicted values.

data to predict the proportion of students who would participate in each year should these slight trends continue on their current trajectories. Table 1 contains the estimates derived from this prediction.

Table 1: Actual and predicted participation in year 12 and year 13

Year 12

KS4 year	N	Actual %	Predicted %	Policy effect % points	Policy effect no. students
2014	33,649	92.52	92.52	7.48	2,518
2015	32,413	92.17	92.21	7.79	2,524
2016	31,203	91.99	91.91	8.09	2,524
2017	30,602	91.57	91.61	8.39	2,569
2018	29,432		91.30	8.70	2,560
2019	30,250		91.00	9.00	2,723
2020	31,606		90.70	9.30	2,941
2021	31,983		90.39	9.61	3,073
2022	33,165		90.09	9.91	3,287

Year 13

KS4 year	N	Actual %	Predicted %	Policy effect % points	Policy effect no. students
2014	33,649	83.73	83.83	16.17	5,442
2015	32,413	83.27	83.32	16.68	5,408
2016	31,203	83.18	82.80	17.20	5,366
2017	30,602	82.05	82.29	17.71	5,419
2018	29,432		81.78	18.22	5,362
2019	30,250		81.27	18.73	5,666
2020	31,606		80.76	19.24	6,082
2021	31,983		80.25	19.75	6,318
2022	33,165		79.74	20.26	6,721

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record.

The predictive model of participation suggests that the RPA policy would potentially increase the number of students participating in education or training by approximately 3,000 in year 12 and around 6,000 in year 13, for each cohort affected.

For the next stage of modelling, the overall participation rates and numbers need to be broken down into the different groups mentioned above (i.e. those voluntarily participating in zero, one or two years post-16). Again, this can be done using linear regression models estimated on the data for the most recent cohorts completing Key Stage 4, allowing us to predict the group membership for several future cohorts.[6]

Figure 4: Actual and predicted pattern of participation by KS4 cohort

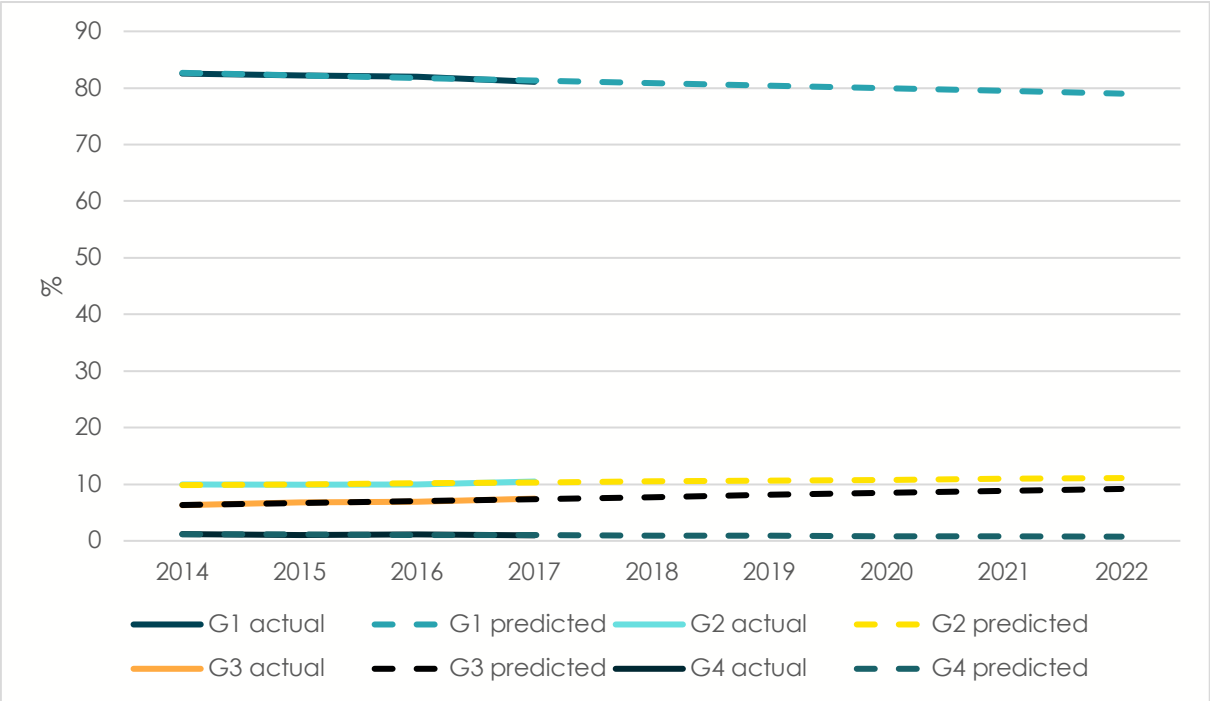


Figure 4 shows that, similarly to the overall patterns of participation in years 12 and 13, the distribution of students across groups has remained stable over recent cohorts with negligible volatility around the steady trend.

[6] Separate linear regression models are estimated for membership of each group, in each case just including a linear time trend.

Table 2: Actual and predicted group membership

		Group 1 (yes, yes)				Group 2 (yes, no)			
KS4 year		Actual %	Predicted %	Actual	Predicted	Actual %	Predicted %	Actual	Pred-icted
2014	33,649	82.54	82.67	27,775	27,818	9.97	9.85	3,356	3,313
2015	32,413	82.26	82.21	26,662	26,647	9.92	10.00	3,214	3,242
2016	31,203	82.04	81.75	25,600	25,509	9.95	10.16	3,104	3,170
2017	30,602	81.08	81.29	24,813	24,877	10.48	10.31	3,208	3,156
2018	29,432		80.83		23,791		10.47		3,082
2019	30,250		80.37		24,313		10.63		3,214
2020	31,606		79.91		25,258		10.78		3,408
2021	31,983		79.45		25,412		10.94		3,498
2022	33,165		79.00		26,199		11.09		3,679
		Group 3 (no, no)				**Group 4 (no, yes)**			
KS4 year		Actual %	Predicted %	Actual	Predicted	Actual %	Predicted %	Actual	Pred-icted
2014	33,649	6.30	6.33	2,119	2,129	1.19	1.16	399	389
2015	32,413	6.81	6.68	2,208	2,166	1.02	1.10	329	358
2016	31,203	6.87	7.04	2,143	2,196	1.14	1.05	356	328
2017	30,602	7.46	7.39	2,284	2,263	0.97	1.00	297	306
2018	29,432		7.75		2,281		0.95		279
2019	30,250		8.10		2,452		0.90		271
2020	31,606		8.46		2,674		0.84		267
2021	31,983		8.82		2,819		0.79		253
2022	33,165		9.17		3,041		0.74		245

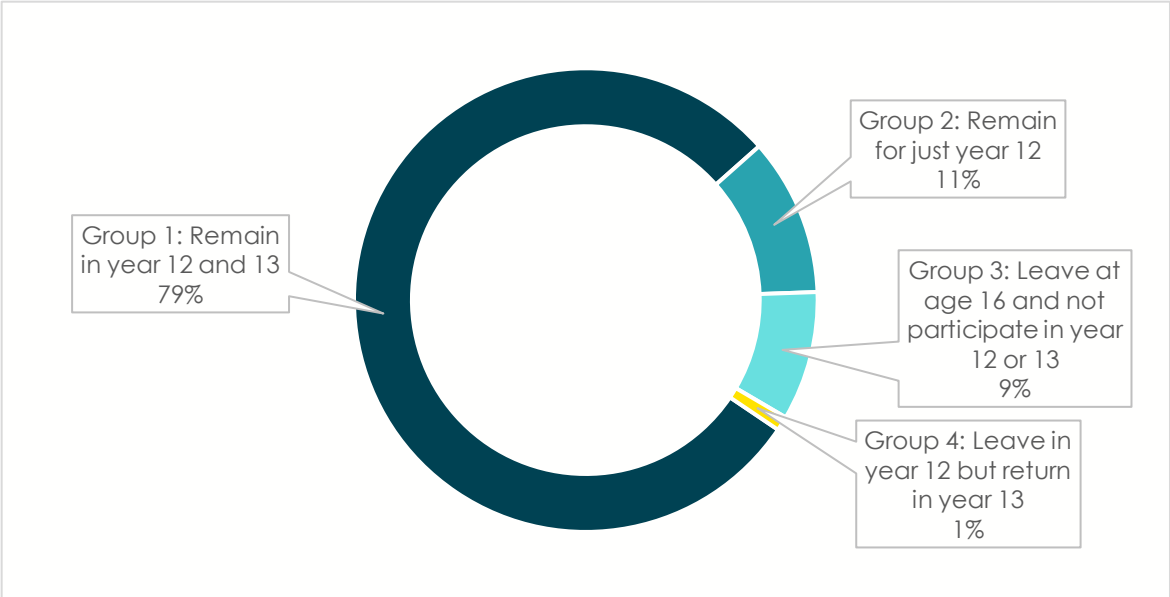
Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record.

The model suggests that for future cohorts, approximately:

- 79% would choose to remain in both year 12 and year 13 voluntarily (group 1 membership);
- A further 11% would remain just for year 12 (group 2);
- Just under 1% would leave in year 12 but return to education or training in year 13 (group 4); and
- The remaining 9% of each cohort would leave education and training at age 16 and not participate during year 12 or year 13 (group 3).

These estimates are shown in Figure 5.

Figure 5: Estimated breakdown of additional predicted participants by group and year, cohort completing KS4 in 2020



Applying the model's predictions to the cohort who completed KS4 in 2020 gives the results shown in Table 3.

Table 3: Additional predicted participants by group and year, cohort completing KS4 in 2020

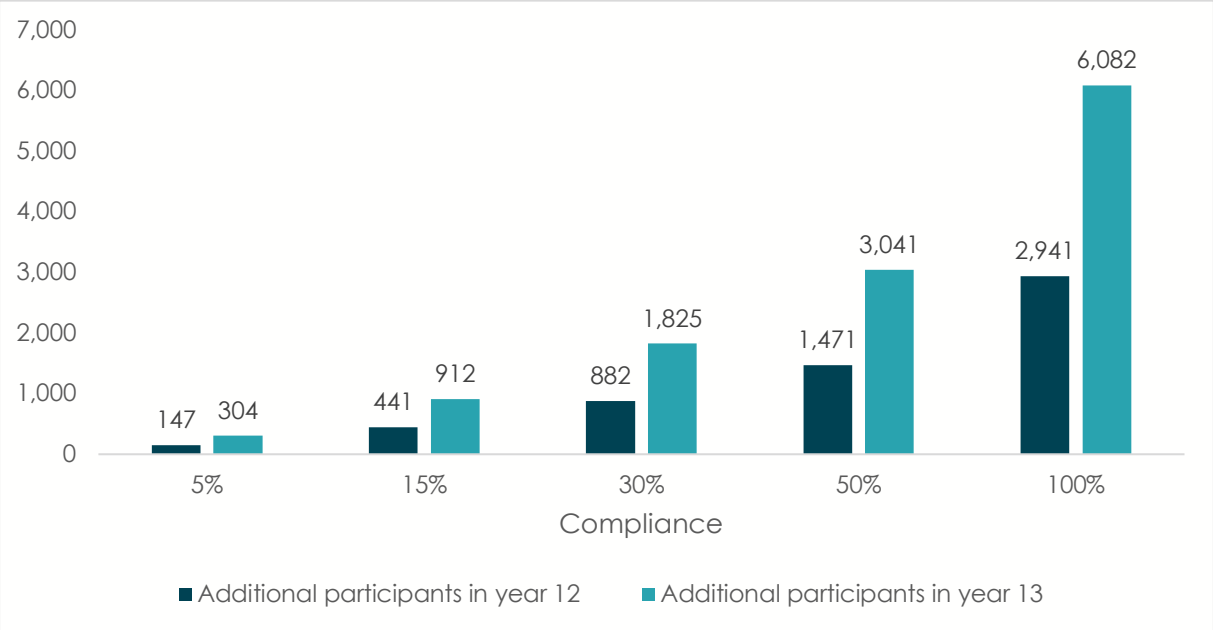
	Participate in year 12	Participate in year 13
Group 2	Already participating	3,408
Group 3	2,674	2,674
Group 4	267	Already participating
Increase	*2,941*	*6,082*

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record.

These figures assume however that all of those who do not currently participate would do so after the introduction of an RPA. However, in light of the qualitative research in this area (see Maguire, 2021) it would be a bold assumption that those whose first choice is to leave education or training in year 12 and/or year 13 would all voluntarily comply with the new requirement. As such, throughout the modelling we allow for a range of degrees of compliance with the policy, ranging from the 100% compliance represented above, down to only 5% compliance. Varying the compliance percentage has important implications for the outcomes of the policy,

firstly in terms of the number of additional participants, as illustrated in Figure 6 (Annex Table A5 shows the corresponding numbers for future cohorts).

Figure 6: Additional predicted participants by year, cohort completing KS4 in 2020, variation by degree of compliance



Should only 5% of the potential additional participants engage with the policy then only around 150 (year 12) and 300 (year 13) more students would be in education or training as a result of RPA. Achieving a level of engagement with the policy such that 30% of those potentially affected do continue in education or training would see almost 900 additional participants in year 12, and around double that in year 13. In year 12 the vast majority of additional participants are from the group who would choose not to participate in either year 12 or year 13 (group 3), and these students make up just under half of the additional students in year 13. As such, engaging these students with the policy will be key in attaining a higher degree of compliance, yet the qualitative research literature in this area repeatedly highlights the difficulty of reaching this group and engaging them with the post-16 education or training offer (see Maguire, 2021). In light of this, **our central modelling scenario will assume a level of compliance of 30%,** which we believe is plausible, however, given the uncertainty around future compliance, throughout the report we also present the estimates associated with compliance at values above and below this figure.

Characteristics of students by group

Before moving on to the next stage of the modelling, it is worth highlighting the different characteristics of the students who voluntarily select into each group as this has important implications for the subsequent stages of the modelling and economic valuation of additional RPA qualifications.

Table 4: Prior attainment and socio-demographic characteristics by group, cohorts completing KS4 in 2014-2017

Group	5A*-G (GCSE/ equiv)	5 A*-G GCSE	5 A*-C (GCSE/ equiv)	5A*-C inc. EWM	5A*-A (GCSE/ equiv)	GCSE 5 A*-C	A*-C MSciEW	Points	Capped points (9)	GCSE Sci A*-C	GCSE Maths A*-C	GCSE Eng A*-C
1	0.9823	0.8942	0.8562	0.6392	0.1902	0.6348	0.6125	546.61	351.9914	0.8859	0.6999	0.7428
2	0.9356	0.7336	0.6522	0.3302	0.0291	0.3015	0.3014	433.22	302.2357	0.7719	0.4155	0.4811
3	0.8221	0.6652	0.5914	0.3719	0.1118	0.3589	0.3521	407.61	283.3888	0.7697	0.4827	0.5223
4	0.8320	0.6545	0.5807	0.3157	0.0362	0.2782	0.2882	385.22	276.8520	0.7374	0.4251	0.4922
Total	*0.9650*	*0.8607*	*0.8146*	*0.5862*	*0.1670*	*0.5799*	*0.5599*	*523.93*	*341.4774*	*0.8665*	*0.6551*	*0.7007*

Group	female	FSM ever	EAL ever	SEN ever	SEN st. ever	Welsh Nat. ID	Fluent Welsh	No Welsh	Study W 1st lang.	Study W 2nd lang.
1	0.5025	0.2558	0.0503	0.3665	0.0293	0.8790	0.1833	0.4019	0.1862	0.8138
2	0.4395	0.4228	0.0343	0.5208	0.0333	0.8554	0.1305	0.4282	0.1286	0.8714
3	0.4118	0.3630	0.0542	0.5274	0.0973	0.7986	0.1180	0.3905	0.1216	0.8784
4	0.4294	0.4012	0.0514	0.5322	0.0782	0.8371	0.1224	0.3943	0.1155	0.8845
Total	*0.4892*	*0.2815*	*0.0489*	*0.3948*	*0.0349*	*0.8706*	*0.1731*	*0.4037*	*0.1756*	*0.8244*

Group	White	Black	Asian	Mixed eth.	Other eth.
1	0.9394	0.0076	0.0223	0.0209	0.0099
2	0.9570	0.0039	0.011	0.0212	0.0069
3	0.9418	0.0084	0.0156	0.0232	0.0110
4	0.9513	0.0029	0.0181	0.0182	0.0094
Total	*0.9415*	*0.0072*	*0.0207*	*0.0210*	*0.0097*

Deciles of Welsh Index of Multiple Deprivation

Group	1	2	3	4	5	6	7	8	9	10	N
1	0.105	0.103	0.099	0.103	0.092	0.099	0.100	0.092	0.100	0.107	104350
2	0.164	0.131	0.119	0.114	0.092	0.087	0.090	0.074	0.071	0.058	12794
3	0.127	0.102	0.095	0.087	0.090	0.108	0.134	0.113	0.080	0.066	8460
4	0.114	0.127	0.111	0.098	0.105	0.105	0.115	0.086	0.075	0.063	1365
Total	*0.112*	*0.106*	*0.101*	*0.103*	*0.092*	*0.098*	*0.101*	*0.092*	*0.096*	*0.099*	*126969*

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record. Based on the cohort completing KS4 2014-2017.

Table 4 shows the prior attainment and socio-demographic characteristics broken down by group. As we would expect, the students who choose to remain in education for two years post-16 (group 1) are positively selected in terms of their prior attainment at KS4: 63.5% attain 5A*-C GCSEs, which is substantially higher than for students in groups 2, 3 and 4 whose corresponding figures are 30.2%, 35.9% and 27.8% respectively. These relative percentages are reflected in other metrics in which group 1 has the highest attainment but amongst groups 2, 3 and 4 it is often students in group 3 who choose not to engage in education or training in the two years post-16 that have higher attainment than groups 2 and 4 who choose to be in education or training for at least one of the first two years post-16. This is particularly the case for metrics based more narrowly on GCSE attainment. The metrics that allow for GCSE and equivalent qualifications however more often see group 2 having higher attainment than groups 3 or 4. Other than group 1, it is not straightforward to predict the membership of the other groups on the basis of prior attainment alone.

In terms of gender, girls are over-represented in group 1, and very much under-represented in the other groups. Boys make up more than 58% of those in group 3 and are 57% of group 4 and 56% of group 2, despite being only 51% of the total group of students. Group 3 are the most likely to have ever been classed as Special Educational Needs (SEN) during their school career and much more likely to have had a Statemented SEN. Group 3 are also the most likely to be an 'English as an Additional Language' (EAL) student during their time in school. As we might expect, the group 1 students are by far the least likely to have ever been Free School Meal (FSM) eligible during their time in school, and are much the most likely to be fluent in Welsh and least likely to have no Welsh language skill. Group 2 students are the most likely to have ever been FSM eligible during their school career.

We are also able to look at the background of students in terms of the level of deprivation in the area in which they live, using the Welsh Index of Multiple Deprivation (WIMD) – see the lower panel of Table 4. We see that students in group 1 are evenly distributed across the WIMD deciles, however, this even distribution is contrasted by groups 2, 3 and 4, reflecting that group 1 students are relatively more advantaged that the other groups. For the other groups, there is under-representation in the very top decile (students living in the least deprived areas), with only 6% of each group in this decile, compared to just over 10% for group 1 students. Similarly, students in groups 2, 3 and 4 are over-represented in the lower deciles, particularly group 2, with 16% of this group's students in the most deprived areas of Wales, and another 13% in the next decile up. Group 2 has a higher proportion of students than group 3 or 4 for each decile in the lower half of the WIMD, and fewer for each decile in the upper half. This echoes the finding on FSM eligibility and suggests that Group 2 students are the most likely to come from less advantaged families.

When it comes to ethnic composition, with the exception of 'Mixed ethnicity', each ethnicity other than 'White' is over-represented in group 1, whereas 'White' ethnicity is underrepresented in group 1 and over-represented in each other group.

In summary, while there is clearly a selection into group 1 on the basis of prior attainment and socio-demographic characteristics, for groups 2, 3 and 4 the relationships are weaker and less straightforward to map. This finding is discussed further in the methodology section of the annex which sets out the reasoning behind our model specification vis-à-vis alternatives. It seems that, compared to groups 3 and 4, the students in group 2, who choose to remain for just one year post-16, are more likely to have a higher proportion of their attainments in GCSE-equivalent qualifications rather than GCSEs and more likely to be from a less advantaged background. Group 3 students have greater attainments in GCSE qualifications than group 2, but lower attainment overall and the group also includes students who are more likely to have had Special Educational Needs, and English as an additional language. This complexity is going to be important in informing the choice of comparison group to be used for estimating the qualification routes and attainments of students in groups 2 to 4 who will be compelled by the RPA policy to remain in education or training.[7]

Although the patterns of group membership and the predictions of this for future cohorts are largely very similar for boys and girls with pooled results shown here for brevity (Annex Tables A1-A4 replicate all of the descriptive tables so far separately by gender), to predict as accurately as possible, all of the modelling at each stage is carried out separately by gender.

[7] As outlined in the methodology section of the annex, the initial model attempted to use the range of prior attainment (up to age 14) and socio-demographic information available for previous cohorts to predict group membership for the future cohorts, which would allow individual level predictions of group and future attainments to be modelled. However, even with a full range of predictors, the model could explain only 6% to 7% of the variation in group membership. Comparison of the mean characteristics of actual group members and predicted group members showed that, apart from group 1, the model was unable to accurately characterize the groups in terms of their observed characteristics, suggesting that unobservable characteristics play an important part in determining choice of group. This is something we try to take into account in subsequent modelling stages as those who choose to be in groups 2, 3 and 4 are different in unobservable ways to students with similar observable characteristics who choose an alternative group.

Stage 2: Modelling course choices of the additional participants

The next stage of the modelling involves estimating the type of education and qualification routes that the additional participants undertake. Before modelling this, we first make the assumption that some of those not participating in education or training in either year (group 3) are employed in jobs that have some training element, but training that does not lead to a formal accredited qualification. As a result, these individuals do not appear as learners in the Lifelong Learning Wales Record (LLWR) data.

Based on the rates of children not in education, employment or training (NEET) for Wales compared to the size of the corresponding non-participants in education or training from the schools and LLWR data, we estimate that 25% of our non-participants are in employment.[8] Based on qualitative evidence on jobs without training (Maguire, 2021) **we make the assumption that a proportion of these jobs (which we fix at 25%[9]) would be converted into level 2 apprenticeships** and so exclude these individuals from the modelling of additional participants and attainments of the RPA students. Instead, we assume they achieve a level 2 apprenticeship at the same rate as individuals in the comparison group who are pursuing a level 2 apprenticeship. We will then add the value of these additional apprenticeships to the overall value calculation.

For the remaining large majority of students for whom we will estimate their route and attainments, we define seven qualification routes that differ in terms of whether they lead to academic or vocational qualifications, and the level of those qualifications. The routes are:

1. Sub level 2 qualifications
2. GCSEs (level 2)
3. Other level 2 qualifications

[8] Welsh data on NEET rates comes from the Statistics for Wales Statistical Bulletin SB31/2019. The most authoritative figures for NEET rates are those calculated on the Statistical First Release basis which suggest a NEET rate of approximately 10% for 16-18 year olds for the years 2014-2018. Author's calculations from the model suggest approximately 13%-14% of this age group are not in education or training each year, suggesting that approximately 25% of these are therefore in employment (3-4%/13-14%).

[9] Since we believe only 25% of the group 3 students are in employment, increasing the percentage that we assume are in jobs with training that convert to apprenticeships has little impact on the overall results.

4. A/AS-levels (level 3)
5. Other level 3 qualifications[10]
6. Mixed route combining academic and vocational qualifications, at a maximum of level 2
7. Mixed route combining academic and vocational qualifications, at a maximum of level 3

Since the young people affected by RPA would choose not to participate in education or training in one of or both of the years following completion of year 11, their distribution across potential routes cannot be observed in the data for previous cohorts. Though for participants in groups 2 and group 4 we can see the choices they make, this does not provide information on what they *would* choose to do when they have to make a decision prior to the start of year 12 over which route they will take in the subsequent *two-year* period. It is likely that the decision made over a two-year route would differ from the decision for year 12 or year 13 only, hence it is necessary to model their choices based on a different comparison group than the existing group 2 and group 4 students.

In order to estimate the routes for the new participants, we therefore use information from the group of students who voluntarily participate in both year 12 and year 13 from previous cohorts (group 1). As those who voluntarily choose to remain in education for years 12 and 13 are different in terms of their prior attainment and individual background characteristics to those who choose to leave (as detailed above), we need to ensure that we are estimating the distribution of students across routes using a group of students as comparable as possible to those who will be affected by the policy. Although we know some characteristics of the students for future cohorts, we obviously cannot know their age 16 attainment levels, and so our approach is first to divide each group of students (groups 1, 2, 3 and 4) in the previous cohorts into cells defined by whether or not they have ever been recorded as eligible for free school meals (FSM)[11] during their school career and whether or not they achieved 5 A*-C grades including English (or Welsh) and Maths in their

[10] Students taking the Welsh Baccalaureate can take either academic or vocational qualifications or a combination of the two and can also be taking qualifications at both level 2 and level 3. For modelling of routes and attainments the individual qualifications comprising the Welsh Baccalaureate are counted individually. The skills certificate elements of the Welsh Baccalaureate are not counted as GCSEs or A-level equivalents as we have no basis on which to estimate their economic value.

[11] This is an imperfect measure of family background but is regularly used as a marker of disadvantage as eligible families are in the poorest 15% of the income distribution.

GCSEs. We then use a linear regression model[12] to predict the distribution of students across these cells within each group, for each of the future cohorts. With our previously predicted group sizes we are then able to estimate the number of students in each group in each of the cells defined by FSM status and prior attainment for each future cohort.

Table 5 shows the breakdown of group membership and cell for the cohort completing KS4 in 2020 separately by gender (Annex Tables A6 and A7 show the comparable tables for the cohorts completing KS4 in 2021 and 2022).

Table 5: Predicted distribution of students across cells defined by lifetime free school meal eligibility status and prior attainment at age 16, cohort completing KS4 in 2020

			proportion of group			
Boys	**prop. of cohort**	**number**	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**
Group 1	0.778	12,588	0.212	0.144	0.544	0.100
Group 2	0.117	1,897	0.354	0.317	0.215	0.114
Group 3	0.096	1,551	0.305	0.307	0.326	0.062
Group 4	0.009	144	0.369	0.328	0.238	0.065
	1.000	16,179				
			proportion of group			
Girls	**prop. of cohort**	**number**	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**
Group 1	0.821	12,669	0.183	0.119	0.579	0.119
Group 2	0.098	1,511	0.314	0.334	0.241	0.111
Group 3	0.073	1,123	0.288	0.264	0.385	0.063
Group 4	0.008	123	0.312	0.351	0.278	0.059
	1.000	15,427				

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record and model prediction.

[12] The model involves separate regressions for each group and uses a linear time trend for each cell extrapolated forwards to predict the proportions in each cell in each group for each future cohort. As there are very few students in group 4, we estimate the cell proportions here by taking the average of the cohorts completing KS4 in 2014-2017 rather than using the linear regressions to predict cell membership.

We can see from Table 5 that students who voluntarily remain in education or training in both year 12 and year 13 are more likely to be in the higher attainment groups at age 16 and less likely to have ever been eligible for FSM. For boys, just under 65% of group 1 students were in the higher prior attainment cells, whereas for groups 2, 3 and 4 the figures are 33%, 39% and 30%. Similarly for girls, it is almost 70% of group 1 students who are in the higher attainment groups, with groups 2, 3 and 4 having 35%, 44% and 34%, reflecting a similar pattern to the boys but showing that the girls out-perform boys on this metric overall. For both boys and girls, amongst the group 1 students, approximately three-quarters have never been eligible for FSM, compared to around 55% for group 2, 65% for group 3 and 60% for group 4.

For both boys and girls in the two higher attainment cells, there is much more weight in the 'never FSM eligible' cells – four to five times more for groups 1, 3 and 4 but interestingly this is not the case for group 2, where it is only about twice the proportion in the 'never FSM eligible' cell compared to 'ever FSM eligible' amongst the students with higher prior attainment. In the two lower attainment cells, for group 1 it remains the case that there is more weight in the 'never FSM eligible' cell for both boys and girls, but amongst the other groups, for lower attainers it is an even split between those ever FSM eligible and never FSM eligible.

In addition to the clearly positive selection of students into group 1 on the basis of prior attainment and lifetime FSM eligibility status, the other main conclusion is that while students in groups 3 and 4 are distributed similarly across cells, group 2 students – those who would voluntarily choose to remain in education or training in year 12 only – are more likely to be in the lower attaining cells and more likely to have ever been eligible for FSM.

Using the predicted proportions from Table 5, we can estimate the number of students in each cell for the cohort completing KS4 in 2020; this is shown in Table 6 (with corresponding tables for other future cohorts in Annex Tables A8 and A9).

Table 6: Predicted number of students in each cell defined by lifetime free school meal eligibility status and prior attainment at age 16, cohort completing KS4 in 2020

Boys	*Estimated number of students*				
	low attainment, never FSM	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**	**Total**
Group 1	2,673	1,809	6,844	1,262	**12,588**
Group 2	671	602	408	216	**1,897**
Group 3	474	476	506	95	**1,551**
Group 4	53	47	34	9	**144**
Total	*3,870*	*2,934*	*7,792*	*1,583*	***16,179***

Girls	*Estimated number of students*				
	low attainment, never FSM	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**	**Total**
Group 1	2,316	1,509	7,334	1,511	**12,669**
Group 2	474	505	365	167	**1,511**
Group 3	324	297	432	70	**1,123**
Group 4	38	43	34	7	**123**
Total	*3,151*	*2,354*	*8,165*	*1,756*	***15,427***

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record and model prediction.

Having estimated the distribution of students across these cells, we are then able to predict the routes taken by each group of students on the basis of the breakdown of routes taken by students in the comparison group for that same lifetime FSM eligibility and prior attainment cell.[13] Rather than using the routes taken by all group 1 students in the same lifetime FSM eligibility and prior attainment cell, we take a further step to restrict the comparison group in order to make it as close as possible to the group of affected students.

To do this, we first use the individual level data from previous cohorts to estimate the probability of remaining in education or training in both year 12 and year 13 (i.e. being a member of group 1) using a very large range of variables capturing the attainments and background characteristics of the individuals throughout their school career from the Foundation Stage upwards, plus information on the schools that they attended.[14] We then take these predicted probabilities and define the comparison group as only those who are in group 1 but whose predicted probability of being in group 1 is below the median predicted probability. Therefore, we are using a comparison group of students who choose to remain in education or training for two years, but who, on the basis of their individual, family, school and prior attainment characteristics, are amongst the least likely students to make this choice. Further, within this comparison group, we look at the distribution of routes separately for each cell defined by lifetime eligibility for FSM and prior attainment at age 16. Table 7 shows the route distribution for each cell for each gender.

[13] The size of the dataset would not allow us to estimate the route by cell distribution for each year and then project that forward for the future cohorts and so we pool the information over the 2014-2017 cohorts to estimate the distribution of students across the seven routes for each of the four cells defined by lifetime FSM eligibility*prior attainment.

[14] The individual level model predicting group 1 membership includes as predictors a comprehensive set of measures of attainment at KS4, KS3, KS2 and the foundation stage, socio-demographic characteristics of the students and characteristics of their school. For a full list of predictors see the annex.

Table 7: Distribution of students across qualification routes by cell defined by lifetime free school meal eligibility status and prior attainment at age 16; based on comparison group in cohorts completing KS4 in 2014-2017

Boys

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	0.2170	0.0416	0.0900	0.1003	0.0756	0.3150	0.1606	1.0000
lower attainment, ever FSM	0.3997	0.0318	0.0518	0.0513	0.0341	0.3232	0.1080	1.0000
higher attainment, never FSM	0.0236	0.0054	0.0455	0.4536	0.1944	0.0803	0.1972	1.0000
higher attainment, ever FSM	0.0710	0.0055	0.0440	0.3549	0.1911	0.1109	0.2225	1.0000

Girls

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	0.1353	0.0598	0.0772	0.1943	0.0911	0.2152	0.2272	1.0000
lower attainment, ever FSM	0.3021	0.0407	0.0670	0.0948	0.0610	0.2608	0.1736	1.0000
higher attainment, never FSM	0.0137	0.0042	0.0265	0.6072	0.1604	0.0262	0.1618	1.0000
higher attainment, ever FSM	0.0425	0.0082	0.0376	0.4496	0.1832	0.0443	0.2347	1.0000

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record and model prediction.

As can be seen in Table 7, even amongst the group 1 students who are the least likely to remain for two years, the students who have attained 5A*-C including English (or Welsh) and Maths at KS4 select into the level 3 academic courses predominantly, especially amongst the girls. 61% of the higher attainment, never FSM eligible girls are on the A/AS-level route, along with 45% of the higher attainers who were ever FSM eligible. For boys the corresponding figures are slightly lower at 45% and 35% respectively, though these are still by far the most populous routes for high attaining boys. Including level 3 vocational courses and these figures go up to 93% and 87% for girls, 85% and 77% for boys – so it is clear that the vast majority of boys and girls who attain 5A*-C including English or Welsh and Maths at GCSE go on to level 3 courses in years 12 and 13.

Amongst those with lower attainment at GCSE, far fewer are pursuing level 3 courses and amongst those who are, there is more weight in level 3 vocational courses and less in academic routes than is the case for those with higher attainment at GCSE. For both boys and girls, 35%-40% of students in the groups with lower attainment at GCSE are taking level 2 courses, and non-trivial proportions are taking vocational courses that are considered to be below level 2. This is particularly the case for boys who have ever been eligible for FSM, with 40% on the sub-level 2 qualifications route. Very few students in year 12 and 13 are doing a large number of GCSEs with many taking mixed courses combining re-taking English or Maths GCSE whilst also pursuing other vocational courses at level 2.

The result of the modelling steps to this point is that for each group of students affected by the policy (groups 2, 3 and 4) we can estimate their composition in terms of prior attainment and lifetime FSM eligibility. For each of these four cells within each group, we can then estimate the number of students taking each of the seven qualification routes based on the routes taken by students from previous cohorts of voluntary participants (group 1 students) with the same lifetime FSM eligibility and prior ability, using just the routes of those students estimated to be the least likely to remain in education or training for an additional two years. In the absence of any available evidence from the literature to suggest an alternative route distribution, it is this distribution that we use in our central scenario.

Whilst this is the best modelling approach given the data, and ensures that we are using the students most comparable to the additional participants to predict their future routes, it is clear that those who choose to voluntarily remain in education or training for two additional years will differ in their unobservable characteristics that we are not able to take account of in the modelling, and which may affect their choice of qualification route and their subsequent attainment. Indeed, as explained in the methodology section of the annex, a rich range of observable characteristics is only able to explain a relatively small proportion of the variance in group membership,

hence unobserved characteristics of individuals (such as conscientiousness, motivation, future orientation, ambition) are very important in explaining why seemingly similar students make different participation choices. In light of the potential for unobservable characteristics to similarly affect route choice, we later consider alternative plausible scenarios for the distribution of students across the qualification routes and the impact this has on overall attainments.

Table 8: Distribution of students across qualification routes by cell defined by lifetime free school meal eligibility status and prior attainment at age 16; cohort completing KS4 in 2020

Boys

	Sub L2	GCSEs	Other L2	A/AS-levels	Other L3	Mixed, max L2	Mixed, max L3	Total
lower attainment, never FSM	253	49	105	117	88	368	188	1,168
lower attainment, ever FSM	438	35	57	56	37	354	118	1,095
higher attainment, never FSM	22	5	42	416	178	74	181	916
higher attainment, ever FSM	22	2	14	112	60	35	70	315
Total	*735*	*90*	*217*	*701*	*364*	*830*	*557*	***3,494***
Proportion on route	*0.2104*	*0.0258*	*0.0622*	*0.2005*	*0.1042*	*0.2376*	*0.1593*	*1.0000*

In addition to these 3,494 group 2, 3 and 4 students, there are 97 from group 3 who we assume are in jobs that convert to level 2 apprenticeships which gives the total additional participants of 3,591.

Total of groups 2, 3 and 4: 3,591

Girls

	Sub L2	GCSEs	Other L2	A/AS-levels	Other L3	Mixed, max L2	Mixed, max L3	Total
lower attainment, never FSM	110	49	63	158	74	175	185	816
lower attainment, ever FSM	250	34	55	78	50	216	144	827
higher attainment, never FSM	11	3	21	488	129	21	130	804
higher attainment, ever FSM	10	2	9	108	44	11	56	241
Total	*381*	*88*	*149*	*833*	*298*	*423*	*515*	***2,688***
Proportion on route	*0.1419*	*0.0327*	*0.0553*	*0.3101*	*0.1108*	*0.1574*	*0.1918*	*1.0000*

In addition to these 2,688 group 2, 3 and 4 students, there are 70 from group 3 who we assume are in jobs that convert to level 2 apprenticeships which gives the total additional participants of 2,758.

Total of groups 2, 3 and 4: 2,758

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record and model prediction.

Table 8 illustrates how we estimate the additional participants in each group are distributed across the qualification routes for the cohort completing KS4 in 2020 (Annex Tables A10 and A11 show the comparable tables for the 2021 and 2022 cohorts). The distribution of students across routes is computed separately for each group using the information in Tables 6 and 7 above, before being summed by cell and qualification route in Table 8. Before distributing these students across routes, we estimate that 97 boys and 70 girls will be in jobs that convert to level 2 apprenticeships as a result of RPA.

Given the predicted sizes of the groups, the distribution across cells within each group, and the distribution of routes within each cell, we see that the male RPA students are distributed such that just over 20% are taking sub-level 2 courses, 33% are taking level 2 courses and the remaining 46% are taking level 3 courses. For the girls affected by RPA, there are fewer students predicted to be on sub-level 2 courses (14%) and level 2 courses (25%) with much more weight on level 3 courses (61%).

This distribution shows how all of the potential additional participants would be distributed across pathways taking into account how these students fit across participation groups and cells defined by their lifetime FSM eligibility status and prior attainment. However, given that we will assume that compliance with the policy is below 100%, Table 9 shows how the total numbers of different pathways are affected by varying compliance (Annex Tables A12 and A13 show the corresponding figures for future cohorts).

Table 9: Distribution of students across qualification routes, variation by degree of compliance; cohort completing KS4 in 2020

Boys

Compliance	Sub level 2	GCSEs	Other level 2	A/AS-levels	Other level 3	Mixed max level 2	Mixed max level 3	Total
5%	37	5	11	35	18	42	28	175
15%	110	14	33	105	55	125	84	524
30%	221	27	65	210	109	249	167	1,048
50%	368	45	109	351	182	415	279	1,747
100%	735	90	217	701	364	830	557	3,494

Girls

Compliance	Sub level 2	GCSEs	Other level 2	A/AS-levels	Other level 3	Mixed max level 2	Mixed max level 3	Total
5%	19	4	7	42	15	21	26	134
15%	57	13	22	125	45	63	77	403
30%	114	26	45	250	89	127	155	806
50%	191	44	75	417	149	212	258	1,344
100%	381	88	149	833	298	423	515	2,688

Based on the extensive review of the evidence from the literature (see Maguire, 2021) our central modelling scenario assumes 30% compliance which would mean an additional 1,048 boys distributed across the qualification routes, plus 97 more doing level 2 apprenticeships. At this level of compliance there would be an additional 806 girls, plus 70 participating via jobs that converted to level 2 apprenticeships.[15]

Stage 3: Modelling attainment by the end of Year 13 for the additional participants

The next stage of the modelling is to predict how many of the additional participants achieve the qualifications that they pursue in the two years of education post-16. As with the choice of qualification routes, there is no information on the attainment rates of the additional participants and so we again use the comparison group to estimate the attainment rate for different qualifications. As with the distribution of students across the qualification routes, this is estimated using the attainment rate for each cell defined by the lifetime FSM eligibility and prior attainment at age 16 amongst those who voluntarily participate for two years but have a low estimated probability of doing so.

To estimate the total economic valuation of the additional attained qualifications, we need to count the qualifications grouped into categories for which estimates of the lifetime economic value are available on a comparable basis. This means that we concentrate on the attainment of:

- 5 or more GCSEs including English and Maths[16], 2 or more A-levels;
- City and Guilds level 3, BTEC level 3, other level 3 vocational qualifications[17];

---

[15] This would give 2,022 additional participants for this cohort. This can also be calculated from the 6,349 additional students predicted in groups 2, 3 and 4 for the KS4 2020 cohort in Table 1. Taking the 97 boys and 70 girls assumed to take jobs that convert to level 2 apprenticeships away leaves 6,182 students. Compliance of 30% would mean 1,855, plus the 97 plus the 70 gives 2,022 additional participants.

[16] In the age 16 attainment data we know whether or not a student has attained 5 A*-C GCSEs including English (or Welsh) and Maths by age 16 but for those failing this measure, we do not know how far they are from attaining this marker. As 90% of the GCSEs taken in year 12 and year 13 are English Language or Maths, we make the assumption that passing GCSE English Language or Maths in year 12 or 13 brings the student across the 5A*-C including English and Maths threshold and therefore value this attainment on that basis. We do not include students in this measure if we see that they pass English or Maths in year 12 or 13 but also fail the other.

[17] We count other level 3 vocational qualifications that have at least as many learning hours associated with them as a level 3 City and Guilds or a level 3 BTEC which each have an average of 500 learning hours. Similarly for other level 2 vocational qualifications, we count those with at least as many learning hours associated with them as a level 2 City and Guilds or a level 2 BTEC which each have an average of 250 learning hours.

- City and Guilds level 2, BTEC level 2, other level 2 vocational qualifications; and
- Apprenticeship at level 3; apprenticeship at level 2.

Using the comparison group of students from group 1 who have low probability of being in group 1, we can estimate the attainment rate for each of these types of qualifications for students on each qualification pathway for each cell defined by lifetime FSM eligibility and prior attainment. As there are 10 qualification outcomes, four cells and seven possible qualification routes within each cell, this gives a total of 280 attainment rates to be used in the analysis. For binary outcomes like attaining 2+ A-levels, the attainment matrix shows the proportion of the cell*route who attain this outcome. For continuous outcomes like the number of level 2 (other) vocational qualifications, the matrix shows the average number of these qualifications attained by students in that cell and route. The full matrix is available in Annex Table A14. As with the estimated distribution of students across routes within a cell, we apply the same matrix of attainment rates for each future cohort.[18]

The attainment rate matrix shows that, for each gender, attainment varies by both the different study routes and by the background and prior attainment of the students. For example, the average percentage of those on the A/AS-level route who attain 2+ A-levels (or equivalent number of AS-levels) by the end of year 13 is 59% or 61% for boys with higher attainment at GCSE depending on whether they have ever been FSM eligible; for equivalent girls these numbers are 75% and 70%. Amongst students with lower attainment at GCSE, the corresponding numbers drop to 28% (never FSM eligible boys) and 19% (ever FSM eligible) and 44% (never FSM eligible girls) and 38% (ever FSM eligible). Unsurprisingly, for individuals on vocational routes the attainment rate of 2+ A-levels is very low, whereas the average number of level 3 BTECs attained for those on the level 3 vocational route is approximately 1.2 amongst the lower attainers at GCSE and about 1.3 for the higher attainers at GCSE. This is true for girls as well as boys, with slightly lower attainment of level 3 BTECs amongst the girls with lower GCSE attainment (0.8 as opposed to 1.2 for the boys). For those pursing level 2 vocational routes, who will be predominantly the lower attainers at GCSE, level 2 City and Guilds, and to a slightly lesser extent level 2 apprenticeships, have high attainment rates.

Using the outputs from the previous stages of the modelling, we have the predicted number of RPA students on each qualification route in each cell defined by lifetime

[18] These attainment rates are calculated using the rates for the cohort completing KS4 in 2017 as it is only for this cohort that we have consistent and comparable information on the attainments of students in both year 12 and year 13.

FSM eligibility and attainment by age 16. Using the estimated attainment rate for each qualification type for each route for each cell, we can now estimate the total number of qualifications attained by the RPA students. However, though the estimated attainment rates are derived from a comparison group who are broadly similar in background and prior attainment, and also have low probability of remaining in education or training for two years, they did nevertheless *choose* to remain in education for two additional years. The first choice of the RPA students on the other hand would not be to remain in education or training for two years. As such, we cannot assume that when compelled to remain in education or training, they would attain qualifications at the same rate as those studying them voluntarily as their first-choice option.

There is no direct evidence of how the RPA student attainment rate would compare to the comparison group. The evidence that does exist to inform the attainment rate suggested an attainment rate of up to 66%.[19] While the RPA students are unlikely to attain at 100% of the rate of the students in the comparison group, the estimated attainment rates already take into account the lifetime FSM eligibility status and prior attainment of the students, and their likelihood of remaining in education or training voluntarily. As such, in the central scenario **we make the assumption that the RPA students attain at a rate of 66.7% of the comparison group**. Given the uncertainty around the attainment rate to use, we also present estimates with the attainment rate reduced to 50%.

Applying this scaling down factor, we can calculate the number of additional qualifications attained for each group. However, as noted above, in light of the findings from the qualitative literature in this area (Maguire, 2021), in all of the modelling we make the assumption that compliance with the RPA policy is significantly below 100%. Based on the evidence, **the central scenario assumes a compliance rate of 30%.** Given the uncertainty around the likely degree of compliance, we evaluate the effect of compliance rates of 5%, 15%, 30%, and 50%. We also include estimates with a compliance rate of 100% as a benchmark.

Table 10 summarises the qualifications that we anticipate would be attained when we scale attainment down by 66.7% and assume a compliance rate of 30% i.e. our

[19] In the English forecast of the RPA effect, evidence on the attainment rates of returners in year 13 in the Youth Cohort Study was used to estimate the discount to the attainment rate, and this was set at 66% or 57% depending on the prior attainment of the students and the level of qualification. Given that unlike the English model we are allowing attainment rates to vary by lifetime FSM eligibility status as well as prior attainment, and using a comparison group comprising only those with a low probability of remaining in education or training, we feel that 66.7% is a realistic choice for the estimate with a lower value of 50% used in our plausible alternative scenarios.

central scenario (Annex Tables A19 and A20 show the equivalent for other future cohorts).

Table 10: Estimated attainment of qualifications by RPA students under the policy, central scenario, for the cohort completing KS4 in 2020

	Boys			Girls		
	Group 2	*Group 3*	*Group 4*	*Group 2*	*Group 3*	*Group 4*
2+ A/AS-level	41	36	3	64	55	5
5 GCSEs inc E/M	62	43	5	50	30	4
C&G level 3	4	3	0	4	3	0
BTEC level 3	101	82	8	77	55	6
Other voc. level 3	4	3	0	11	8	1
C&G level 2	67	50	5	23	15	2
BTEC level 2	2	1	0	1	1	0
Other voc. level 2	35	26	3	36	22	3
Apprenticeship level 3	5	4	0	3	2	0
Apprenticeship level 2	34	63	3	15	37	1

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record and model prediction.

The very small size we predict for the group 4 participants, coupled with the compliance rate and scaled down attainment rate, results in very few additional qualifications of any kind being achieved by this group of students; this is true for both boys and girls. For groups 2 and 3 there are many more qualifications predicted to be obtained, with girls in each group predicted to obtain more A-levels than GCSEs, and boys predicted to attain more at GCSE than A-level – reflecting the difference in academic routes that boys and girls undertake in these groups. For both genders there are a greater number of qualifications attained by group 2 relative to group 3 though this is in part driven by the larger size of group 2 (20% larger than group 3 for boys, 33% larger for girls) but will also reflect different characteristics of the group 2 students and the routes they choose. The number of level 2 apprenticeships predicted for group 3 include those that are for jobs without formal training that convert to apprenticeships.

Modelling the voluntary attainment of group 2 and group 4 participants in the absence of the RPA policy

The next stage of the modelling is to estimate the additional qualifications attained under RPA and estimate the additional economic value of these qualifications. To do this, we first need to estimate the attainments that we predict each group affected – group 2, group 3 and group 4 – would achieve over the two years post-16, and

remove the attainments that we estimate students in groups 2 and 4 would achieve in the one year that they participate voluntarily in the absence of the RPA policy.

As we *do* observe the routes and attainments that students in these groups in previous cohorts undertake, we are able to use this information to estimate the routes and attainments over one year of education or training for the students of future cohorts that we expect to be in these groups. As with the main model, we estimate these routes and attainments separately for each cell defined by lifetime FSM eligibility and prior attainment at age 16. Unlike in the main model, we do not have to do anything further to construct a comparison group as we can use the entire set of group 2 and group 4 students from previous cohorts as the comparison group. Tables A15-A18 in the annex contain the routes matrix and attainments matrix for group 2 and group 4 in the absence of the policy. The attainments we estimate for each of these groups in the absence of RPA are included in Table 11 below. It is important to note that unlike the participation and attainments for groups 2 and 4 under RPA, these attainments are not adjusted for compliance. Given that these are estimated attainments from voluntary participation it would not make sense to scale them down by a compliance parameter as this participation is not the result of complying (or not) with a policy but is undertaken voluntarily.

Estimated net attainments by group

We use the estimated attainments after two years for each group under the RPA policy, and the estimated attainments after one year that we expect for group 2 and group 4 in the absence of the policy, to estimate the net attainment for each group under RPA. For group 3 there is nothing to net off as they do not participate in either year in the absence of the policy.

The compliance rate that we assume under RPA relates to engagement with the RPA policy over the two-year period post-16. As noted above, for groups 2 and 4, in the absence of the policy the students in these groups would be expected to participate and attain qualifications in line with the attainments of voluntary participants from previous cohorts. We make the assumption that in the estimates with the RPA policy implemented, the attainments that group 2 and group 4 students would achieve in the absence of the policy are the minimum attainments that we would expect the RPA students in groups 2 to 4 to achieve in total – regardless of the compliance rate. It would not be logical to estimate lower levels of attainment in these groups with a compulsory policy than would be achieved voluntarily in the absence of the policy. Therefore, when we adjust compliance, if this suggests a level of attainment *below* the estimated attainments that group 2 and group 4 would achieve in the absence of the policy, we do not record a negative effect of the policy; we rather assume a zero effect of the policy in these groups. That is, we do not allow the

compulsory policy to lead to *lower* levels of attainment than we would expect when participation is voluntary. For group 3 there are no qualifications attained in the absence of the policy and so regardless of compliance level there is almost always a positive effect of the policy in this group.

Table 11: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario, for the cohort completing KS4 in 2020

Boys	**Group 2**			**Group 3**			**Group 4**			
	Under RPA	*Absent RPA*	*Net additional*	*Under RPA*	*Absent RPA*	*Net additional*	*Under RPA*	*Absent RPA*	*Net add-itional*	*Total additional*
2+ A/AS-levels	41	34	7	36	0	36	3	4	0	**43**
5 GCSEs (E/M)	62	121	0	43	0	43	5	7	0	**43**
No. L3 C&G	4	5	0	3	0	3	0	0	0	**3**
No. L3 BTEC	101	52	49	82	0	82	8	10	0	**131**
No. L3 other voc.	4	3	2	3	0	3	0	1	0	**5**
No. L2 C&G	67	67	0	50	0	50	5	14	0	**50**
No. L2 BTEC	2	13	0	1	0	1	0	1	0	**1**
No. L2 other voc.	35	49	0	26	0	26	3	5	0	**26**
No. app'ships L3	5	0	5	4	0	4	0	2	0	**9**
No. app'ships L2	34	18	16	63	0	63	3	16	0	**80**

Girls	Group 2			Group 3			Group 4			
	Under RPA	*Absent RPA*	*Net additional*	*Under RPA*	*Absent RPA*	*Net additional*	*Under RPA*	*Absent RPA*	*Net add-itional*	*Total additional*
2+ A/AS-levels	64	55	9	55	0	55	5	3	2	**66**
5 GCSEs (E/M)	50	95	0	30	0	30	4	9	0	**30**
No. L3 C&G	4	2	2	3	0	3	0	1	0	**5**
No. L3 BTEC	77	73	3	55	0	55	6	10	0	**59**
No. L3 other voc.	11	1	10	8	0	8	1	0	1	**19**
No. L2 C&G	23	35	0	15	0	15	2	2	0	**15**
No. L2 BTEC	1	0	1	1	0	1	0	1	0	**2**
No. L2 other voc.	36	96	0	22	0	22	3	7	0	**22**
No. app'ships L3	3	1	2	2	0	2	0	3	0	**4**
No. app'ships L2	15	9	6	37	0	37	1	8	0	**43**

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record and model prediction.

Table 11 shows the net additional attainments we expect for each group as a result of RPA (Annex Tables A19 and A20 show the equivalent for other future cohorts). Adjusting compliance down to 30% results in no more attainment by the group 4 participants than we would expect to be achieved voluntarily in the absence of the policy, for almost every type of qualification for each gender.[20] Similarly for group 2 the adjustment to the compliance rate under RPA means that there are only small net gains in terms of additional attainments for most types of qualification, the exceptions being level 3 BTECs for boys. It is group 3 where the benefits of the policy are most keenly observed, here there are numerous additional qualifications of each type, especially for boys, even with a 30% level of compliance. This is particularly the case for vocational qualifications, with 77 additional level 2 vocational qualifications, along with 63 level 2 apprenticeships, and with 88 additional level 3 vocational qualifications.

Stage 4: Estimating the lifetime economic value of these additional attainments

Having estimated the increase in a range of qualifications that we forecast the additional participants will acquire, and taken away the attainments that we expect these students would have achieved voluntarily in the absence of the policy for each group, we are in a position to assign an economic value to these additional qualifications. As we assume that additional qualifications have a positive impact on employment and earnings throughout the individual's working lifetime, we value the additional attainments based on estimates of their lifetime economic value.

The estimated lifetime productivity increases associated with the set of qualifications we are interested in have previously been estimated by the Department for Education (2014) and the former Department for Business, Innovation and Skills (2011). The former estimates the lifetime productivity returns for A-levels, 5A*-C GCSEs including English and Maths, and apprenticeships at level 2 and level 3, each separately by gender; the latter estimates the returns for City and Guilds at level 2 and level 3, BTEC at level 2 and level 3, and NVQ qualifications at level 2 and level 3.[21]

---

[20] For boys there is a technically a small estimated net increase in level 3 City & Guilds attainment though it is essentially zero (+0.02).

[21] There are a number of vocational qualifications that are not City & Guilds, BTEC or NVQs. For these we value the qualification using the NVQ value given that NVQ qualifications cover a broader range of subject areas than the more specific City & Guilds and BTEC qualifications. In each case we ensure that the vocational qualification is counted only if it is of a comparable size to a standard City & Guilds or BTEC qualification at the same level.

The methodology used to calculate the economic values is very similar in each case, and follows the guidance set out in the HM Treasury Green Book.[22] The estimates are for the marginal return to attaining these qualifications compared to qualifications one level below, discounted back to the present.[23] In each case, the assumption is that the new qualification is the highest that an individual attains. Given that the RPA participants are compelled to undertake these qualifications at all, it is a reasonable assumption that following the completion of their further two years in education they then choose to join the labour market. Based on the qualitative evidence in this area, we make this conservative assumption that rules out those who attain 2 or more A-levels going on to obtain a degree, in which case the return on the 2 or more A-levels would be higher than we estimate.

Table 12: Discounted lifetime productivity differentials by gender

Qualification	Men	Women
2+ A-levels	£104,000	£88,000
Level 3 Apprenticeship	£202,000	£90,000
Level 3 City & Guilds	£135,000	£135,000
Level 3 BTEC	£97,000	£97,000
Level 3 other vocational	£101,000	£101,000
5A*-C GCSEs (inc. Eng/Maths)	£119,000	£122,000
Level 2 Apprenticeship	£160,000	£78,000
Level 2 City & Guilds	£104,000	£104,000
Level 2 BTEC	£83,000	£83,000
Level 2 other vocational	£63,000	£63,000

Source: A-levels, GCSEs, apprenticeships: author's calculations using Department for Education (2014); City & Guilds, BTEC, other vocational: author's calculations using Department for Business, Innovation and Skills (2011); discounted values in 2019 £, using ONS Average Weekly Earnings Time-Series (EMP).

[22] https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent

[23] The two Government reports deriving these estimates were released in 2014 and 2011 respectively and use data up to that point to calculate the lifetime valuations. The figures they report have been updated to 2019 values using the Office for National Statistics Whole Economy Level (£): Seasonally Adjusted Regular Pay Excluding Arrears to adjust in line with average pay growth. The figures from the 2011 report have been adjusted to mirror the exact methodology from the 2014 report. In all cases these productivity figures assume a 30% increase over the wage premium associated with the qualification, but do not assume any automatic annual wage growth. The figures also assume that 100% of the estimated employment return is the direct causal effect of the qualification attainment.

Table 12 summarises the discounted present value of each qualification.

The standard methodology for estimating returns on qualifications provides an estimate based on the steady state of the labour market, that is, assuming the distribution of qualifications amongst other workers is held constant. In reality, the return on qualifications will be affected by the supply of individuals with those qualifications in the labour market – as more individuals hold a particular qualification, the economic return associated with it will fall, assuming a constant level of demand for workers with that qualification. For these estimated values to be appropriate therefore, it must be the case that the additional participants resulting from RPA are not so numerous that the supply of workers with each qualification changes sufficiently to affect the equilibrium return associated with each qualification. Given the relatively small numbers of individual affected by RPA in each cohort it is very likely that these estimated returns would not be affected by the increased supply of workers with these additional qualifications.

The economic valuations that have been estimated for the set of qualifications we examine are based on the lifetime productivity increases associated with individuals who acquire these qualifications voluntarily. We are able to create a comparison group of students who have a broadly similar background and prior educational attainment profile to the RPA students, and this gives confidence that the routes and attainment levels estimated are realistic, especially once attainment rates are scaled down. With the economic valuations, however there is no differentiation by background in terms of the qualification's value and in some cases no differentiation by gender. Therefore, we are not able to apply valuations that are more relevant to the group of RPA students in the same way that we made appropriate adjustments in earlier stages of the modelling.

We know that the RPA students differ from those who voluntarily continue to participate post-16 in terms of their observable characteristics and it is very likely that they also differ in unobservable characteristics – conscientiousness, motivation, future orientation, ambition for example – that affect their choice post-16 and also affect their labour market outcomes, such as lifetime employment profile and earnings. As such, the estimated lifetime returns to the additional qualifications taken from the literature are likely to over-estimate the lifetime return to these same qualifications for the RPA students. **We make a conservative assumption that the returns for RPA students are only 50% of the returns for the students who voluntarily acquire these qualifications.** However, we also present additional estimates under the scenario where the returns for RPA students are the same as the returns for students who acquire them voluntarily.

Estimated economic benefits of the RPA attainments

Having estimated the additional qualifications that we expect would be attained under the policy, it is now possible to multiply the number of these additional qualifications by their estimated lifetime productivity values to obtain an estimate of the economic value of the policy.

As discussed in the preceding subsections, we assume that 25% of those in group 3 are in jobs with training and that 25% of these convert to apprenticeships at level 2. We also assume that within cells defined by lifetime FSM eligibility and prior attainment at age 16, the qualification routes distribution for the RPA students follows the same distribution as the comparison group of low probability group 1 participants in previous cohorts. We assume that attainment of qualifications amongst the RPA students is at 66.7% the rate of voluntary students in the comparison group and that the lifetime economic value of these qualifications is 50% that of the voluntary students in the comparison group. These assumptions are summarised in Table 13. In the following section we present estimates under alternative modelling assumptions, which then allow us to construct a range of plausible estimates for the potential economic impact of the policy.

Table 13: Summary of modelling assumptions in the central scenario

Compliance with policy	30%
% of jobs becoming apprenticeships	25%
Qualification route distribution	As per comparison group
Attainment rate % compared to voluntary participants	66.7%
Economic valuation of qualifications compared to voluntary participants	50%

The estimated economic benefits of RPA in education or training to 18 in Wales are summarised in Table 14 and Figure 7 for the cohort that completed KS4 in 2020. The corresponding estimates for the cohorts completing KS4 in 2021 and 2022 are in the Annex Tables A21 and A22, with the overall totals for these years also displayed in Table 15 and Figure 8.

Table 14: Estimated economic benefits of the RPA to 18 in Wales, central scenario, cohort completing KS4 in 2020

	Boys	Girls	Total
Economic benefits of the additional attainments of group 2 participants	£4,628,000	£1,969,000	£6,597,000
Economic benefits of the additional attainments of group 3 participants	£17,736,000	£11,411,000	£29,147,000
Economic benefits of the additional attainments of group 4 participants	£1,515	£141,000	£143,000
Overall additional economic benefit	£22,366,000	£13,521,000	**£35,887,000**

Source: Combined data from all modelling stages.

Figure 7: Estimated economic benefits of the RPA to 18 in Wales, central scenario, cohort completing KS4 in 2020

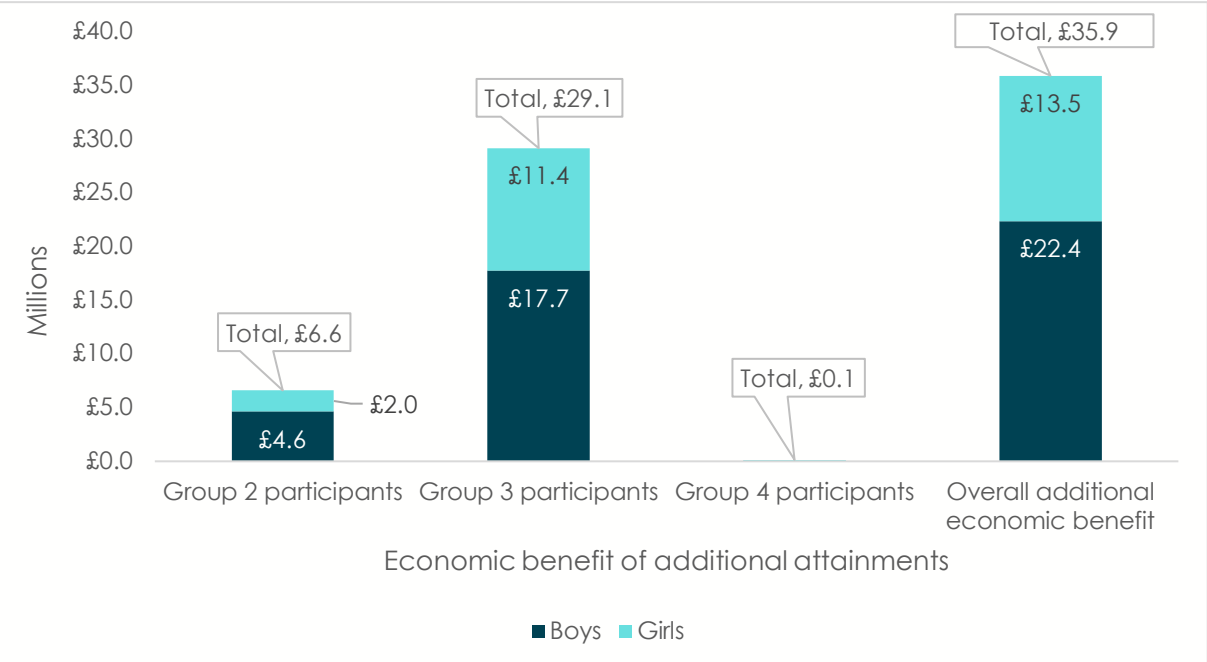
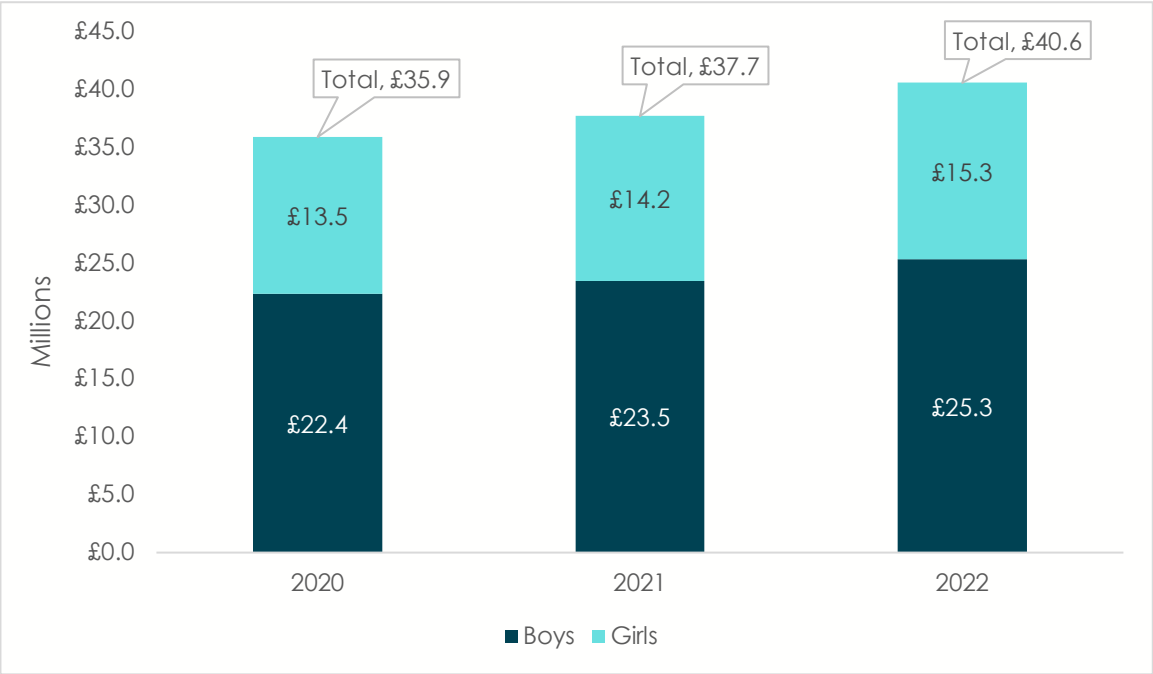


Table 15: Estimated economic benefits of the RPA to 18 in Wales, central scenario, by cohort

		Boys	Girls	Total
Cohort completing KS4 in 2020-2022	**N**			
2020	31,606	£22,366,000	£13,521,000	**£35,887,000**
2021	31,983	£23,462,000	£14,234,000	**£37,696,000**
2022	33,165	£25,317,000	£15,255,000	**£40,571,000**

Figure 8: Estimated economic benefits of RPA to 18 in Wales, central scenario, by cohort



The central scenario estimate is that the additional qualifications attained under the RPA policy would have an additional lifetime productivity value of £35.9 million. Table 14 illustrates that **the vast majority of the economic benefits of the policy relate to the additional attainments estimated for the group of students who would previously not have participated in either year 12 or year 13 (group 3).** There are very few students in group 4 who leave education and training after KS4 but return to participate in year 13. In the absence of RPA these students are estimated to attain some qualifications in their year of participation and for RPA we only value their attainments over and above those that we estimate they

would have achieved in year 13 only. Combined with an assumption of only 30% compliance with the policy, this leads to effectively zero additional qualifications being obtained by this group.

For group 2, who would voluntarily participate in year 12, we similarly estimate their attainments of qualifications in year 12 and subtract this level of qualification attainment from the attainments we estimate for this group under RPA. These students attain substantially more qualifications under RPA than would otherwise have been expected, and so even with only 30% compliance there is additional economic value, particularly for boys. The extra year of participation drives greater attainment of level 3 vocational qualifications that would not be attained in just one year of participation in the absence of the policy. As illustrated above, there are more boys affected by the policy and they tend to select more into the vocational courses that have a higher economic return. As Table 12 shows, the economic returns to qualifications are estimated to be higher for men in many cases hence the higher economic value estimates for boys in groups 2 and 3 who make up the vast majority of the additional participants.

Table 15 shows that there is variation in the estimates by year but that this variation is mainly related to the cohort size as the raw numbers of additional participants increase with the cohort size.

Alternative scenarios analysis

The modelling process incorporates a number of assumptions in relation to:

- compliance with the policy;
- the percentage of jobs with training that become apprenticeships;
- the routes taken by the additional RPA students;
- the rate at which they attain these qualifications; and
- the relative economic valuation of these attainments.

In the subsequent alternative scenarios analysis we maintain the assumption, based on the qualitative evidence (see Maguire, 2021), that 25% of jobs without training become apprenticeships at level 2. As discussed above, we estimate that only 25% of group 3 would be in jobs without formal training in the absence of RPA and so changing the percentage of these jobs that become apprenticeships has only a small effect on the overall attainments of the RPA students. For the economic value of the qualifications, increasing the percentage of the voluntary students' value of each qualification will simply scale the total values that we estimate using 50%. Below we show our estimates allowing for the same (100%) economic return for the RPA

students as the voluntary students. In addition, our alternative scenario analysis considers the impact of changing compliance with the policy, the routes taken by the RPA students and the attainment rate of these students.

In light of the qualitative evidence (see Maguire, 2021) we believe that the key parameter in the model is the degree of compliance with the policy that is achieved. Based on the evidence, our central scenario assumes 30% compliance, but below we show the impact on attainments and valuations of altering this to different values from 5% to 50%, plus the attainments for 100% compliance as a benchmark.

Table 16: Estimated numbers of additional qualifications due to RPA, alternative modelling assumptions

Boys:

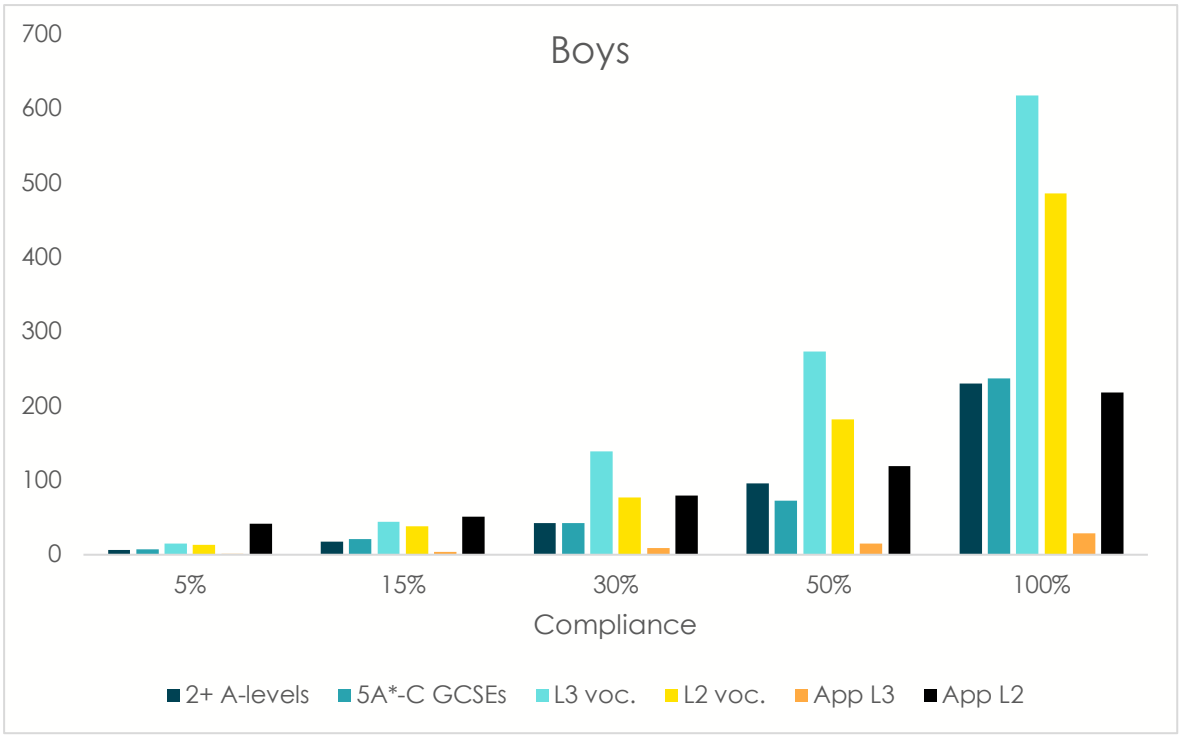
Compliance	2+ A-levels	5A*-C GCSEs	L3 voc.	L2 voc.	App L3	App L2
5%	6	7	15	13	1	42
15%	18	21	44	38	4	51
30%	43	43	139	77	9	80
50%	96	73	273	182	15	119
100%	230	237	618	486	29	218
Central scenario but with…						
…only 50% attainment rate	27	32	91	58	7	55
…no academic routes	4	38	286	95	17	94
…lower L3 %	31	46	28	172	10	134

Girls:

Compliance	2+ A-levels	5A*-C GCSEs	L3 voc.	L2 voc.	App L3	App L2
5%	9	5	12	6	0	29
15%	27	15	38	19	1	33
30%	66	30	82	39	4	43
50%	148	50	189	70	7	59
100%	355	174	464	202	15	100
Central scenario but with…						
…only 50% attainment rate	42	22	58	29	2	30
…no academic routes	6	27	267	41	9	52
…lower L3 %	46	35	27	90	2	76

Source: author's calculations using Welsh National Pupil Database, the Pupil Level Annual Schools Census, the Post-16 Data Collection and the Lifelong Learning Wales Record and model prediction.

Figure 9: Estimated numbers of additional qualifications due to RPA, alternative modelling assumptions (compliance)



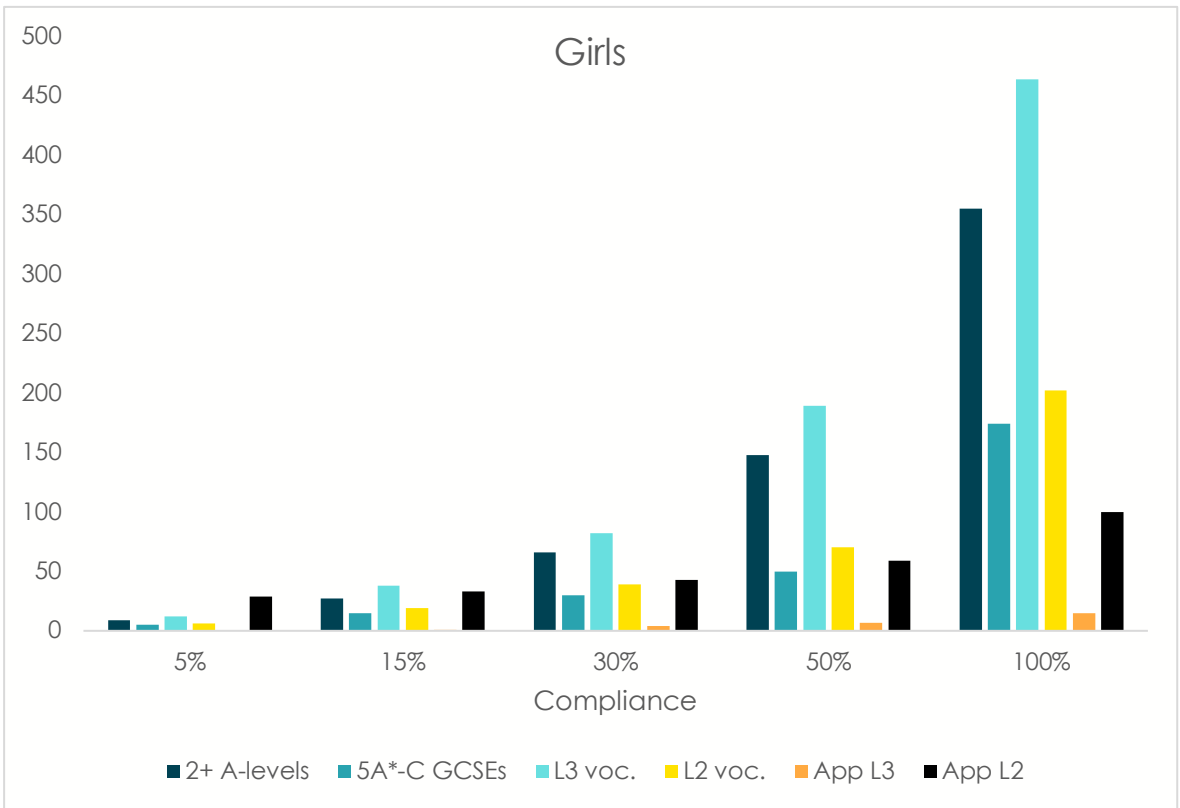
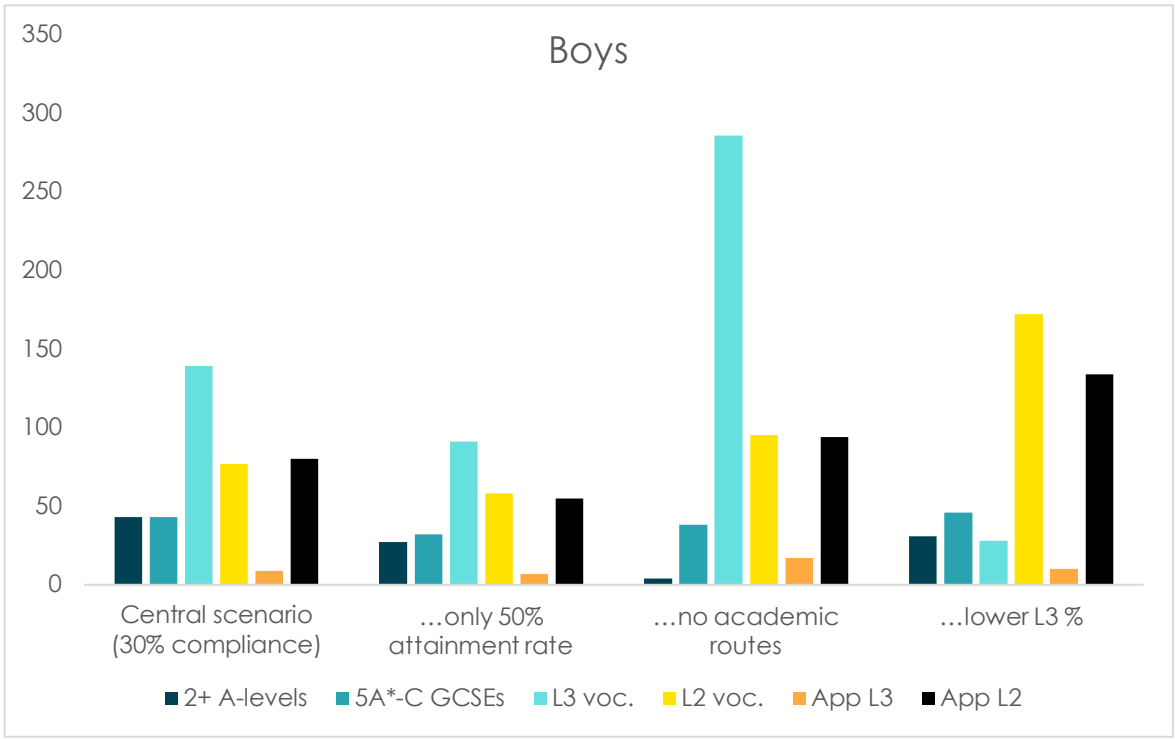
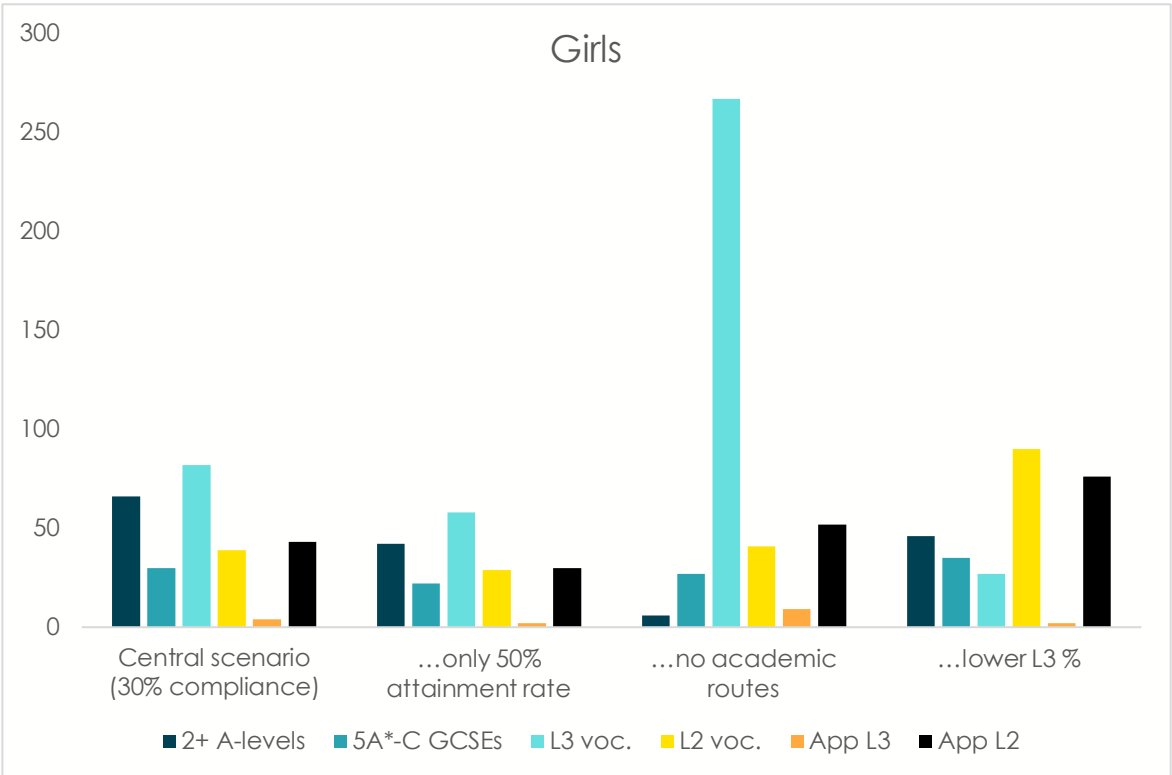


Figure 10: Estimated numbers of additional qualifications due to RPA, alternative modelling assumptions (qualifications attainment rate, qualification route distribution)





As illustrated in Table 16[24] and Figure 9, the impact of increasing compliance from very low levels is to substantially increase the number of qualifications attained. This is mainly because below 30% compliance the attainments of groups 2 and 4 under RPA are below what we would expect them to attain voluntarily in the absence of the policy and so there are no additional attainments from these groups. This is still the case for group 4 at 30% compliance but as we move above this level, there are additional attainments not only from group 3 but from group 2 (particularly) and group 4 also, rapidly increasing the numbers of qualifications attained.

The lower rows of Table 16 and Figure 10 show the impact of setting all assumptions at the central scenario but firstly varying the qualifications attainment rate from 66.7% of the voluntary participant attainment rate to only 50%, and then of varying the distribution of RPA students across qualification routes from the distribution amongst the comparison group that we use in the central scenario. We apply two different plausible alternative distributions. In the first, we move all RPA students from academic routes onto vocational routes at the same level. In the second, we reduce the proportion of students undertaking level 3 qualification routes by moving all on level 3 vocational routes to level 2 vocational routes and by moving the lower attaining at KS4 (those who do not attain 5A*-C including English (or Welsh) and Maths at GCSE) from level 3 academic routes to level 2 academic routes. For those undertaking mixed vocational/academic routes we switch them from level 3 to level 2. This results in the proportion of the RPA students taking level 3 courses reducing from 59% to 25% for boys and from 75% to 37% for girls.

Compared to the central scenario (30% compliance row of Table 16), reducing the attainment rate to only 50% reduces attainments by a quarter to one third, which is approximately what we would expect compared to the 66.7% attainment rate. There is variation in this because the reduction in attainments affects only the RPA scenario, not the qualifications attained by group 2 and 4 in the absence of the policy, and the latter differ for each qualification.

Again, comparing to the central scenario, altering the distribution of students across qualification routes such that none are allocated to the academic routes, strongly reduces the attainment of A-levels since most students pursuing A-levels are on this route. For GCSEs, the reduction is much lesser as there are more students doing mixtures of academic and vocational courses that involve taking English or Maths GCSE plus additional non-academic qualifications. The largest increases are in the number of level 3 vocational attainments – this is because of the reallocation of A-

[24] Tables 16, 17 and 18 are built using the numbers from Annex Tables A23-A29 which recreate Table 11 for the seven alternative scenarios analysed.

level route students to level 3 vocational courses for all groups, and the higher level of attainment of these vocational qualifications compared to A-levels. This is particularly notable for girls as the central scenario has 30% of girls on the A-level route (compared to 20% for boys) and so there are more girls moving to the level 3 vocational route than is the case for boys. Finally, reducing the proportions taking level 3 qualification routes and increasing those taking level 2 routes has the effect of reducing level 3 attainment and increasing attainment at level 2, as might be anticipated. There is more of an effect for boys as they are more likely to be studying a level 3 vocational course than girls, and it is the vocational and mixed routes where we reduced the level 3 participation.

Table 16 shows that the estimated attainment of additional qualifications is sensitive to the assumptions we make about the routes students take and the extent to which they attain the qualifications they pursue, relative to similar students who voluntarily participate. However, the key message from this alternative scenario analysis is the importance of compliance for determining the additional attainments that result from RPA. For levels of compliance below 30% the numbers of additional qualifications are small and wholly attributable to the attainments of group 3 only.

Tables 17 and 18 and Figures 11 and 12 show the effects of these scenarios and more on the economic value of qualifications attained under RPA. Our central scenario assumes compliance of 30% and this leads to a total net benefit of the policy of £35.9m for the cohort completing KS4 in 2020.

Table 17: Estimated economic benefits of the RPA to 18 in Wales for the cohort completing KS4 in 2020, alternative scenario analysis: compliance and attainment rate

Qualification routes: as per the comparison group

	66.7% attainment rate			**50% attainment rate**		
Compliance	Boys	Girls	Total	Boys	Girls	Total
5%	£5.6m	£2.8m	**£8.4m**	£4.2m	£2.1m	**£6.3m**
15%	£10.6m	£6.6m	**£17.2m**	£8.0m	£4.9m	**£12.8m**
30%	£22.4 m	£13.5m	**£35.9m**	£15.5m	£9.4m	**£24.8m**
50%	£42.2m	£27.2m	**£69.4m**	£28.8m	£18.3m	**£47.0m**
100%	£98.9m	£68.6m	**£167.5m**	£69.1m	£46.8m	**£115.9m**

Source: Combined data from all modelling stages. Assumptions as per central scenario other than compliance and attainment rate.

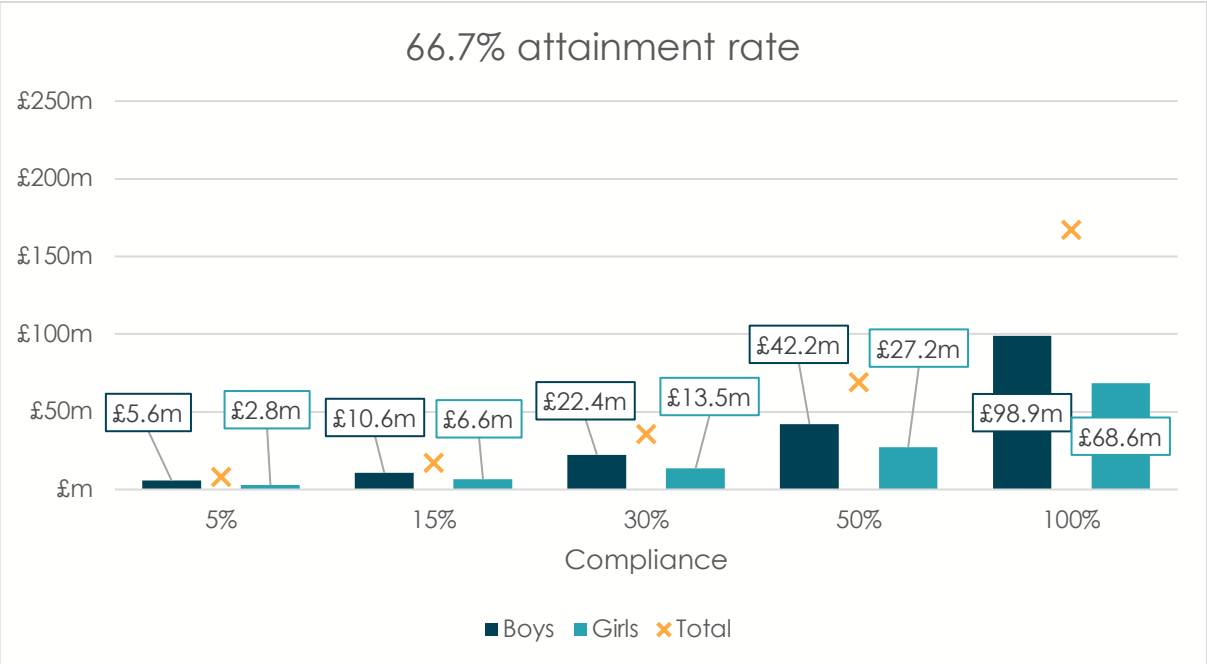
Table 18: Estimated economic benefits of the RPA to 18 in Wales for the cohort completing KS4 in 2020, alternative scenario analysis: compliance and qualification routes

Attainment rate: 66.7%

	All vocational routes			Level 3 routes reduced		
Compliance	Boys	Girls	Total	Boys	Girls	Total
5%	£6.1m	£3.3m	**£9.4m**	£5.8m	£2.9m	**£8.7m**
15%	£14.1m	£8.6m	**£22.7m**	£12.4m	£7.1m	**£19.5m**
30%	£30.0m	£20.9m	**£50.9m**	£25.7m	£14.8m	**£40.5m**
50%	£54.2m	£38.1m	**£92.3m**	£46.4m	£27.5m	**£73.9m**
100%	£119.6m	£85.6m	**£205.2m**	£108.3m	£70.7m	**£179.0m**

Source: Combined data from all modelling stages. Assumptions as per central scenario other than compliance, and qualification routes. Level 3 participation is reduced by moving all on L3 vocational routes to L2 vocational routes and by moving the lower attaining at KS4 from L3 academic routes to L2 academic routes. This results in the proportion of the RPA students taking level 3 courses reducing from 59% to 25% for boys and from 75% to 37% for girls.

Figure 11: Estimated economic benefits of the RPA to 18 in Wales for the cohort completing KS4 in 2020, alternative scenario analysis: compliance and attainment rate



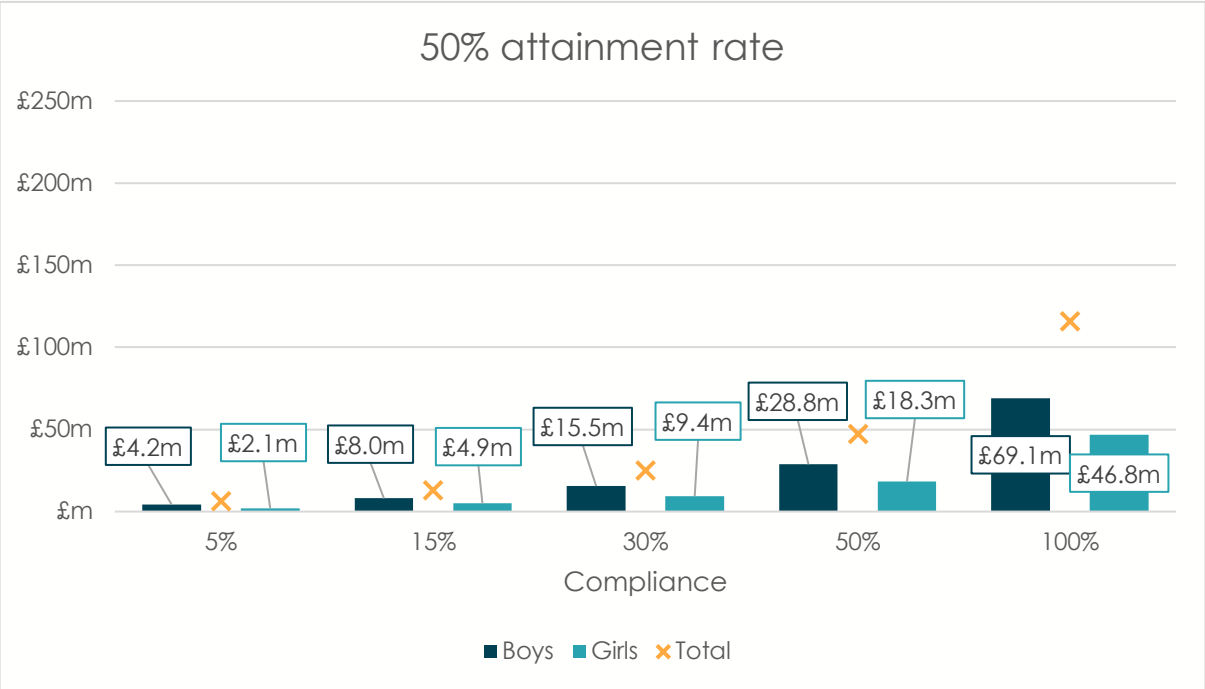
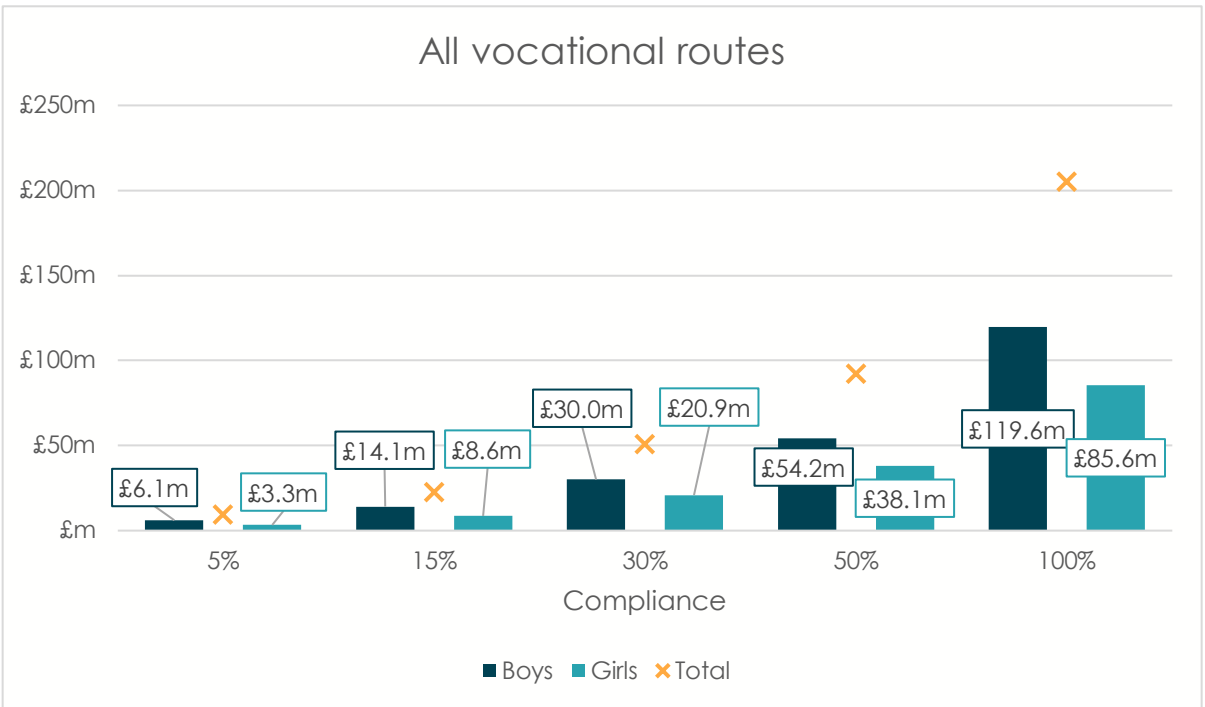
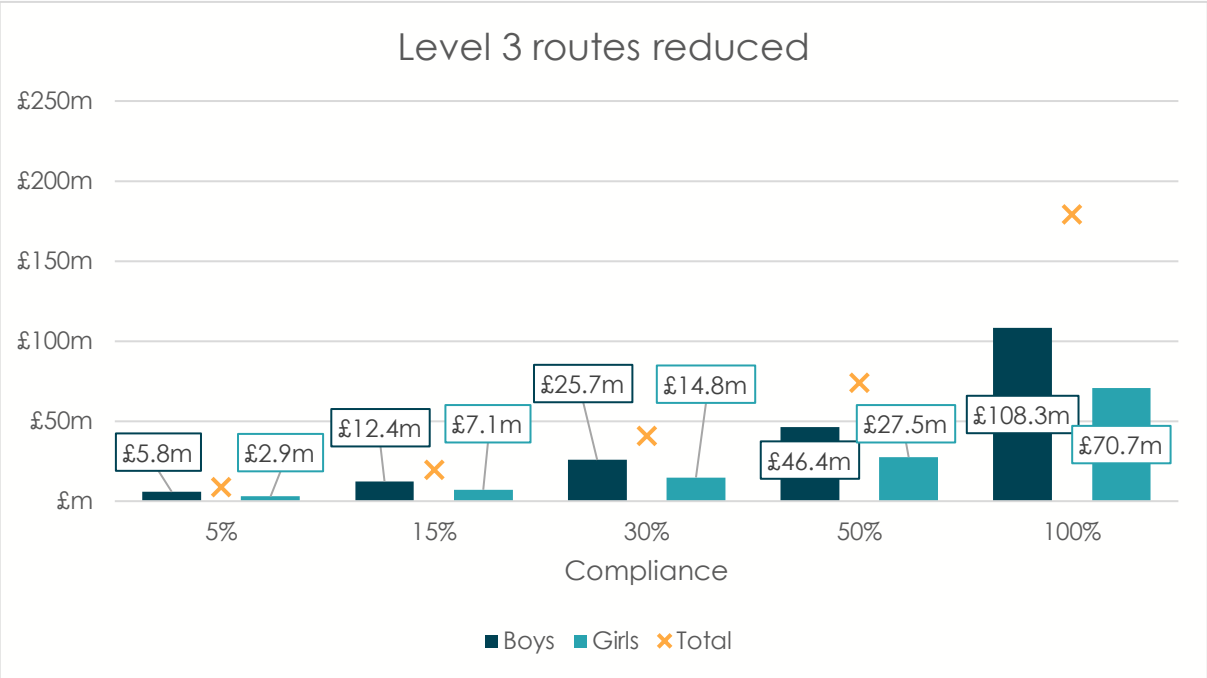


Figure 12: Estimated economic benefits of the RPA to 18 in Wales for the cohort completing KS4 in 2020, alternative scenario analysis: compliance and qualification routes





The left panel of Table 17 is the set of assumptions that represents our central scenario, with each row representing a different level of compliance. We shade the 30% compliance row as this represents our central estimate. It is clear from Figure 11 and the left-panel of Table 17, and indeed Figure 12 and the right panel and both panels of Table 18, that increasing compliance has a dramatic effect on the estimated value and that the relationship is non-linear. In Figure 11 and the left-panel of Table 17, increasing compliance from 5% to 15% approximately doubles the estimated economic value of the policy. Doubling from 15% to 30% compliance also leads to approximately a doubling of the economic value, and in moving from 30% to 50% the value again doubles. These patterns are reflected both in the overall total and the values for boys and girls respectively. The relatively low valuations at 5% compliance reflect the fact that we only anticipate additional attainments in group 3 under this scenario – that is, the attainments of groups 2 and 4 would be no higher than what we expect in the absence of the policy and so there is no additional economic value. As compliance increases, the attainments of group 3 increase, as do those of groups 2 and 4, and these latter groups start to add to the overall economic benefits of the policy.

Focusing on the right-side panel of Table 17, we see that lowering the attainment rate of qualifications from 66.7% of the attainment rate of voluntary participants to 50% has the effect of scaling down the economic values approximately in line with this reduction. At very low levels of compliance, even with 66.7% attainment there are no additional attainments from group 2 and group 4 relative to what we anticipate they would voluntarily achieve in the absence of the policy. As such the difference with the left panel are all driven by lower qualification rates amongst the group 3

students. As compliance increases, the difference in attainments between groups 2 and 4 with a 50% attainment rate compared to 66.7% becomes more pronounced and hence the values in the right panel reduce further relative to the corresponding values in the left panel than is the case for 5% or 15% compliance.

In line with the analysis of Table 16, the key finding from this compliance variation is that engaging the students who would otherwise choose to leave, and therefore ensuring compliance is above the minimal levels in the first two rows of Table 17, could dramatically increase the economic value of the policy. This finding is true in our central scenario set of estimates but also holds true in the other alternative scenarios analysis in Table 18 and Figure 12.

Turning to Table 18 (and Figure 12), these scenarios exactly match the central scenario in the left panel of Table 17, other than changing the distribution of students across the various qualification routes. Looking at the left panel, we see that switching students away from academic courses and into vocational programmes actually increases the economic value of the policy. The reason for this perhaps surprising result is that the majority of students who will be affected by the policy have lower levels of attainment at KS4, and for these students, the attainment rates of vocational qualifications are often higher than for academic qualifications, whereas the economic values of many of the vocational qualifications are not much lower than the academic equivalents, and in the case of apprenticeships there are relatively high returns. We see this again reflected in the right-panel of Table 18: reducing the proportion of students taking level 3 qualifications actually has a small positive effect on the estimated total value of the policy. This is because the attainment rates in level 2 qualifications are for the majority of RPA students higher than the level 3 attainment rates, and though returns on level 3 qualifications are higher across the board, the increase in attainment at level 2 more than offsets the reduction in the individual value of the qualifications, such that the net result is an increase in total economic value.

Tables 19 and 20 replicate the analysis of Tables 17 and 18 but for the case where we make the stronger assumption that the economic value of the qualifications attained by RPA students is exactly the same as the value for those who attain the qualifications voluntarily. The relationships between the values in the different rows and columns of these tables are by construction exactly as per Tables 17 and 18 as each value has simply been doubled, reflecting the doubling of the economic valuation from 50% to 100%. The Tables are included to allow a broader range of estimates to be easily considered. For example, making the more conservative assumption that attainment is at 50% of the voluntary rate but that once attained the qualifications confer the same economic value to the RPA students as voluntary participants sees the value of the policy for 30% compliance at just under £50m.

Similarly, in Table 20 we see that assuming a lower proportion of RPA students take level 3 qualifications than in the comparison group, they attain at 66.7% the rate of voluntary students but gain the same return on these qualifications, with the value for 30% compliance being just over £80m.

Table 19: Estimated economic benefits of the RPA to 18 in Wales for the cohort completing KS4 in 2020, alternative scenario analysis: compliance and attainment rate, higher economic valuation of qualifications

Qualification routes: as per the comparison group

	66.7% attainment rate			**50% attainment rate**		
Compliance	Boys	Girls	Total	Boys	Girls	Total
5%	£11.2m	£5.6m	**£16.8m**	£8.4m	£4.2m	**£12.6m**
15%	£21.2m	£13.2m	**£34.4m**	£16.0m	£9.8m	**£25.6m**
30%	£44.8m	£27.0m	**£71.8m**	£31.0m	£18.8m	**£49.6m**
50%	£84.4m	£54.4m	**£138.8m**	£57.6m	£36.6m	**£94.0m**
100%	£197.8m	£137.2m	**£335.0m**	£138.2m	£93.6m	**£231.8m**

Source: Combined data from all modelling stages. Assumptions as per central scenario but with qualifications valued at 100% of the economic value for voluntary participants, and compliance and attainment rate varying.

Table 20: Estimated economic benefits of the RPA to 18 in Wales for the cohort completing KS4 in 2020, sensitivity analysis: compliance and qualification routes, higher economic value of qualifications

Attainment rate: 66.7%

	All vocational routes			**Level 3 routes reduced**		
Compliance	Boys	Girls	Total	Boys	Girls	Total
5%	£12.2m	£6.6m	**£18.8m**	£11.6m	£5.8m	**£17.4m**
15%	£28.2m	£17.2m	**£45.4m**	£24.8m	£14.2m	**£39.0m**
30%	£60.0m	£41.8m	**£101.8m**	£51.4m	£29.6m	**£81.0m**
50%	£108.4m	£76.2m	**£184.6m**	£92.8m	£55.0m	**£147.8m**
100%	£239.2m	£171.2m	**£412.4m**	£216.6m	£141.4m	**£358.0m**

Source: Combined data from all modelling stages. Assumptions as per central scenario but with qualifications valued at 100% of the economic value for voluntary participants, and compliance and qualification routes varying. Level 3 participation is reduced by moving all on L3 vocational routes to L2 vocational routes and by moving the lower attaining at KS4 from L3 academic routes to L2 academic routes. This results in the proportion of the RPA students taking level 3 courses reducing from 59% to 25% for boys and from 75% to 37% for girls.

Discussion

The modelling exercise in this report attempts to estimate the impacts of RPA in education or training to 18 in Wales. The cohort of focus is the young people who completed KS4 in 2020, with the corresponding estimates for the 2021 and 2022 cohorts contained in the annex. Deriving the estimated impacts involved a number of modelling stages to estimate:

- the number of additional participants compelled to remain in education or training by the policy;
- the qualification routes that they would pursue;
- the attainments that they would achieve by the end of year 13 (over and above what we estimate they would achieve in the absence of the policy); and
- the economic value of these additional attainments.

The economic values result from higher productivity and greater likelihood of employment resulting from the attainment of additional qualifications.

For future cohorts and for the most recent ones completing KS4 we do not know their choices post-16 and so the voluntary participation rates need to be estimated based on the patterns of previous cohorts. Moreover, by definition, the first choice of those not continuing in education or training post-16 is to leave the education system, hence the need to make assumptions in order to model the qualification routes that we expect these additional participants to take, and the attainments they would achieve by the end of year 13. Crucially, we also have to make an assumption about the extent to which these individuals – who are disengaged with the education system and would choose to leave – will comply with the policy itself.

These assumptions mean that there is a great deal of uncertainty in the estimated benefits of the policy in terms of the additional attainments and their economic value. Whilst acknowledging this uncertainty, we base our central scenario estimates on what we believe to be the most plausible set of values given the evidence base in this area. For this central scenario, we estimate a benefit of £35.9m for the cohort completing KS4 in 2020. The alternative scenarios analysis gives a range of estimates from £6.3m to £92.3m if we assume compliance is between 15% and 50% and vary other parameters such as the attainment rate of qualifications or the routes that the RPA students would choose. If we further make the more heroic assumption that the lifetime earnings return on qualifications is the same for RPA students as it is for students voluntarily remaining in education post-16 (rather than 50% of this return), then this alternative scenarios range becomes

£12.6m to £184.6m. For whichever value we choose for this scaling of economic returns value, the analysis shows that **it is varying compliance with the policy that has the largest impact on the estimated additional attainments and therefore on the additional economic value**. For example, a compliance level of 15% rather than the 30% we assume under our central scenario set of assumptions decreases the economic value of the policy from £35.9m to £17.2m. Engaging more students on vocational routes or on level 2 rather than level 3 courses increases the economic value, but not by as large an extent as increasing compliance with the policy, particularly to 30% or higher.

Given the importance of the underlying assumptions for any conclusions regarding the value of the policy, we are careful to make what we believe are the most realistic assumptions for our central scenario. We believe that given the stable patterns of participation and group membership over recent cohorts, the estimates of the number of students affected will be very accurate. Indeed, in Table 3 we can see that for the years where we know the number of students in each group and also have the model prediction, our predicted values are all within 1% to 2.5% of the actual values for groups 1-3 – only in group 4 where the numbers of students are much smaller is there a greater margin of error. We also believe that our central scenario set of assumptions for the proportion of jobs that would become level 2 apprenticeships, the distribution of the other RPA students across qualification routes, their attainment rates and the relative economic value of their attainments represent the most realistic scenario. The qualitative evidence in this area suggests that 25% of jobs becoming apprenticeships is a reasonable figure. As this affects only 25% of the group 3 students that we estimate are in jobs without formal training in the absence of the policy, the impact of changing this assumption would be very small.

In terms of the qualification routes chosen by RPA students, the comparison group of students used to estimate this are those in group 1 who have low probability of remaining in education or training for two additional years but do so nevertheless, and within this those defined by lifetime FSM eligibility and prior attainment at KS4. This group is well matched on observable characteristics to the RPA students, particularly those in group 3, thus it is reasonable to assume that the choices the RPA students would make over courses are likely to be similar to this group. For the same reasons, the assumption that RPA students attain at 66.7% of the rate of the comparison group students with broadly the same prior attainment and background characteristics, does not seem too heroic. In both cases, we are comparing the RPA students to voluntary participants who are observably similar however we are not able to take account of the unobserved differences between the groups of students which may be important in determining their qualification routes and attainments. The alternative scenario analysis suggests that changing the routes and the attainment

rates does have some effect on the number of additional attainments under the policy though not as much as variation in compliance. We do not consider the routes and attainment assumptions in the central scenario to be particularly sensitive to these alternative reasonable assumptions.

The assumption that the economic value of the qualifications for the RPA students is only 50% of that for voluntary participants goes some way to address the issue of unobservable factors that differ between the RPA students and those undertaking the qualifications as their first-choice post-16 destination. In the labour economics literature on the returns to education, typical regression models including a large number of background characteristics as well as education level, explain between 25% and 40% of the variation in earnings (see Harmon and Walker, 1995; Dickson, 2013). Unobservable factors clearly play an important part in determining the economic return to qualifications. Therefore, assuming that those who select into qualifications voluntarily have unobserved human capital factors that increase their economic value over and above the causal effect of the qualifications themselves, we believe it is a reasonable assumption that the economic returns for qualifications attained by RPA students is only 50% of that observed amongst voluntary participants. Should we wish to make the stronger assumption that once attained the value of qualifications is the same as for voluntary participants, this entails doubling the estimated economic values for each scenario (as per Tables 19 and 20). The value associated with the policy for any assumption regarding the relationship between the voluntary return and the RPA student return on qualifications can be computed by scaling the figures in Tables 19 and 20.

The central and alternative scenario analyses provide a wide range of potential outcomes from the RPA policy, depending on the assumptions made at each stage of the modelling. Which assumptions are most appropriate will depend in part on the way in which an RPA policy is implemented and any other supporting policies that are introduced alongside it. The most important assumption for determining the value of the policy is the level of compliance achieved which itself will depend on the post-16 education and training offer available (see Maguire, 2021). At present, those who would be impacted by the RPA policy do not see the benefit of continuing in education or training in any of the available routes. If the offer remains unchanged, the qualitative evidence suggests that it is unlikely that the disengaged students impacted by the policy will voluntarily comply in large numbers. Amongst those who do, achieving attainment rates of up to 66.7% of the voluntary student rate will again depend in part on the options being offered and additional support available to these students.

It is worth noting that the estimated economic value is that of the additional attainments over and above what would be expected in the absence of the policy, but

importantly we do not take into account the costs of providing the additional education, therefore our central estimate of £35.9m represents the gross economic benefits. This is also just an estimate of the economic value of the productivity increases associated with the policy – it does not take into account any additional benefits of increased participation and attainment in terms of health, wellbeing, social inclusion, civic participation and reduced crime.

The effect of the RPA in England to 17 in 2013 and then up to 18 in 2015 on attainment has not yet been fully evaluated but we can look at the impact of the previous raising of the minimum school leaving age to 16 in the UK in 1972, whilst bearing in mind the differences between RPA and raising of the school leaving age (RoSLA) policies. As with RPA, the RoSLA policy compelled disengaged students whose first choice was to leave education at age 15 to remain for an additional year. The impacts of this policy on educational attainment and subsequent labour market outcomes have been extensively studied (see Buscha and Dickson, 2012, 2015; Dickson, 2013; Dickson and Smith, 2011; Grenet, 2013; Delaney and Devereux, 2018) and the consensus is that requiring these disaffected young people to remain in education did lead to an increase in attainment at age 16 (CSEs) and also led to increased lifetime earnings. Indeed, the literature suggest that it is the additional qualifications attained that drive most of the return to the extra year of education (Dickson and Smith, 2011; Grenet, 2013). It is notable that fewer young people attained academic qualifications at the time of the 1972 RoSLA which would increase the economic value of these qualifications for students who gained them as a result of the policy. Even with this caveat, the evidence suggests that policies similar to RPA, targeting similar populations of students, can have positive impacts on qualification attainment and that these additional qualifications do have long-term economic value. This supports our assumptions that the RPA students would attain a positive number of additional qualifications, despite remaining in education not being their first choice, and that these qualifications will have a future economic return.

The literature also finds positive effects of the additional education resulting from previous increases in the school leaving age on health (Davies et al., 2018; Janke et al., 2020), crime (Machin et al., 2011), early child-bearing (Silles, 2011) and on the educational attainments of the next generation (Dickson et al., 2016). As such, policies that increase educational attainments are likely to produce positive impacts in a number of non-labour market domains.

However, while RoSLA is clearly a related policy, it is crucial to note that unlike RPA it represented a fundamental change to compulsory secondary schooling, with years of preparatory work and investment in resources and infrastructure. Moreover, compliance with RoSLA was legally enforced and the literature suggests a near total level of compliance with the policy. Therefore, the estimated returns for RoSLA are

equivalent to our 100% compliance scenarios. Given the different institutional context for RPA, and the qualitative evidence on the group of students who will be affected by the policy, it is very unlikely that high levels of compliance will be achieved, therefore any comparison with the effects of RoSLA must be very cautious.

It is also very important to note that the vast majority of the attainments and the economic benefits as a result of RPA relate to the additional attainments of the group of students who would choose not to participate in either year in the absence of RPA. From the qualitative research in this area we know that these students (approximately 9% of each cohort, or around 2,500 students) are the most disengaged with the education system and hardest to reach. This highlights the substantial degree of uncertainty around the estimated effects of the policy – should only a low level of compliance among this group be achieved then the additional attainments and associated economic values will be very small indeed. Even with 30% compliance the additional economic value of RPA attainments is only estimated to add 1.4% to the value of qualifications that the 2020 KS4 cohort would achieve post-16 in the absence of the policy.

The key to the policy achieving an economic return, and any other returns, is the degree to which young people affected by it are re-engaged with the education system and an offer that appeals, such that they voluntarily comply with rather than defy the policy requirements to continue in education and training to age 18. Without an improved education and training offer that appeals to the students who currently reject the post-16 options available, it will be very difficult to achieve the sort of participation required to increase overall attainment levels and realise the potential economic values estimated in this analysis.

Conclusion

In this report we estimate the impacts of RPA in education or training to 18 in Wales, quantifying the effect on number of participants and their educational attainments. For the cohort who completed KS4 in 2020, the central scenario suggests an additional 900 students would be in education or training in year 12 and 1,800 in year 13. The addition to attainments achieved would be in the order of a 1.0% increase in the cohort's attainments of 2 or more A-levels, and a 2.5% increase in attainment of the key GCSE threshold, compared to what would be attained by the cohort in the two years post-16 in the absence of the policy. The estimated economic benefits of all of the additional academic and vocational qualifications would be approximately £36 million, which is approximately a 1.4% increase on the £2.55 billion lifetime value

of the academic attainments we would expect this cohort to attain in years 12 and 13 in the absence of RPA.

There is however a great deal of uncertainty around this central estimate, primarily driven by the effect that changing compliance has on the estimated attainments under RPA. Increasing compliance to 50% would mean the number of new participants would increase to approximately 1,500 in year 12, and 3,000 in year 13, and result in additional qualifications worth £70m (a 2.7% increase in the cohort's lifetime economic valuation of qualifications). Similarly, varying other model assumptions impacts the projected attainments and their value: keeping compliance at 30% but lowering the attainment rate of qualifications by the RPA students from 66.7% of the voluntary rate, to only 50% of that rate, is associated with additional qualifications valued at approximately £25m per cohort.

The central scenario estimate of a 1.4% increase in the economic value of the cohort's attainments rests on the assumption that a compliance level of 30% is achieved. This is not certain given the affected group are the most disengaged with education and the hardest to reach through blanket policy interventions. Though it is beyond the scope of this report to consider the efficacy of other policies in the round, the modelling in this paper is compatible with other policies that aim to increase participation, if 'compliance' is interpreted as the proportion of students who engage in additional years of education as a result of alternative policies. This will be relevant given that the qualitative research in this area (see Maguire, 2021) would suggest that re-engagement of the non-participants post-16 may be better achieved by alternative policies that specifically target increased voluntary participation rather than a compulsory participation policy that, unless accompanied by a more attractive set of post-16 options, is unlikely to lead to a high degree of compliance.

References

Buscha, F., and Dickson, M. (2012). **Raising the School Leaving Age: Returns in Later Life**. Economics Letters, 117, 389-393.

Buscha, F., and Dickson, M. (2015). **The wage returns to education over the life-cycle: Heterogeneity and the role of experience**. IZA Discussion Paper no.9596.

Davies, N., Dickson, M., Davey Smith, G., van den Berg, G., and Windmeijer, F. (2018). **The Causal Effects of Education on Health, Mortality, Cognition, Well Being, and Income: Evidence from the UK Biobank**. Nature Human Behaviour, 2, 117-125.

Delaney, J., and Devereux, P. (2019). **More Education, Less Volatility? The Effect of Education on Earnings Volatility over the Life Cycle**. Journal of Labor Economics, 37(1), 101-137.

Department for Business, Innovation and Skills. (2011). **Returns to Intermediate and Low Level Vocational Qualifications**. BIS Research Paper no. 53.

Department for Education. (2016). **Participation of young people in education, employment or training. Statutory guidance for local authorities**. DFE-00255-2016. Retrieved from: **https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/561546/Participation-of-young-people-in-education-employment-or-training.pdf**

Dickson, M. (2013). **The Causal Effect of Education on Wages Revisited.** Oxford Bulletin of Economics and Statistics, vol. 75(4), 477-498.

Dickson, M, Gregg, P., and Robinson, H. (2016). **Early, late or never – when does parental education impact child outcomes?** The Economic Journal, 126, F184-F231.

Dickson, M., and Smith, S. (2011). **What Determines the Return to Education: an extra year or a hurdle cleared?** Economics of Education Review, 30(6), 1167-1176.

Grenet, J. (2013). **Is extending compulsory schooling alone enough to raise earnings? Evidence from French and British compulsory schooling laws.** The Scandinavian Journal of Economics, 115(1), 176-210.

Harmon, C., and Walker, I. (1995). **Estimates of the economic return to schooling for the United Kingdom**. American Economic Review 85(5), 1278-1286.

Hayward, H., Hunt, E., and Lord, A. (2014). **The economic value of key intermediate qualifications: estimating the returns and lifetime productivity gains to GCSEs, A levels and apprenticeships.** Department for Education, Research Report no. DFE-RR398A.

Hunt, E., and McIntosh, S. (2007). **Raising the Participation Age: An Assessment of the Economic Benefits.** Department for Children, Schools and Families, Research Report no. DCSF-RW026.

Janke, K., Johnston, D., Propper, C., and Shields, M. (2020). **The Causal Effect of Education on Chronic Health Conditions in the UK.** Journal of Health Economics. 70, 102252. Retrieved from: **https://doi.org/10.1016/j.jhealeco.2019.102252**

Machin, S., Marie, O., and Vujić. (2011). **The Crime Reducing Effect of Education**. Economic Journal. 121(552), 463-484.

Maguire, S. (2021). **Raising the Age of Participation to 18**. Cardiff: Wales Centre for Public Policy. Retrieved from: **https://www.wcpp.org.uk/publication/raising-the-age-of-participation-in-education-to-18/**

Siles, M. (2011). **The effect of schooling on teenage childbearing: evidence using changes in compulsory education laws.** Journal of Population Economics 24(2), 761-777.

Statistics for Wales. (2019). **Young people not in education, employment or training (NEET) Year to 31 March 2019**. Statistical Bulletin, SB31/2019.

Annex

Data

The data on the attainments of previous cohorts comes from the National Pupil Database Wales. The background characteristics of students are recorded in the Pupil Level Annual Schools Census. The qualifications pursued in school post-16 and the attainments on these are recorded in the Post-16 Data Collection. Qualifications pursued in Further Education and attainments are recorded in the Lifelong Learning Wales Record (LLWR). We use data from each of these datasets, linking pupils across the different datasets using a unique pseudonymised identifier for each pupil. We acknowledge with thanks the assistance of Stephen Hughes from Welsh Government School Statistics and Jonathan Ackland from Welsh Government Post-16 Education Statistics in preparing the relevant datasets for this project.

Information on the qualifications in the Post-16 Data Collection and the LLWR are merged in from the Qualifications in Wales database, allowing a consistent comparison of the very large number of different qualifications available to learners in post-16 education in Wales.

Cohorts

For the majority of the modelling we use information from the four cohorts who completed KS4 in the years 2014, 2015, 2016 and 2017. The initial plan was for the model to use information from additional years, going back as far as the cohort completing KS4 in 2011. However, the way in which the data was collected changed in 2014 leading to some volatility in terms of the participation figures for the early years. Moreover, the data in the Post-16 Data Collection needed to classify qualification routes, is only fully available from the 2014 cohort onwards hence for both of these reasons we chose to use only the most recent cohorts for whom the data has been measured on a consistent basis. This means that for the purposes of modelling the additional participants, their distribution across groups, the distribution of characteristics across groups, the qualification routes taken by cell (defined by lifetime FSM eligibility and prior attainment), we use the cohorts completing KS4 in 2014-2017. For attainments, we only have consistent information allowing all academic and vocational qualifications to be compared on a consistent basis for the years from 2017-2019. This means that for predicting the attainments of group 2 and group 3 participants the model can only use the cohort completing KS4 in 2017 as this is the only cohort for whom we know year 12 and year 13 attainments in full and

can compare qualifications of different types consistently. Therefore, the main attainment prediction matrix is derived from the cohort completing KS4 in 2017. For group 4 attainments in the absence of the RPA policy, we are able to use both the cohort completing KS4 in 2017 and the cohort completing KS4 in 2016 as their year 13 attainments are known for the years in which they undertake them (i.e. 2019 for the cohort completing KS4 in 2017, and 2018 for the cohort completing KS4 in 2016).

Methodology

The initial starting point for a methodology to predict the impact of a potential RPA policy is to model the number of students who would be affected, and the degree to which they would be affected i.e. would RPA entail one or two additional years of education and training. We therefore characterise the pathways that students voluntarily take post-16 into four mutually exclusive groups as set out in Figure 2. Given the richness of the data available for current cohorts in the National Pupil Database and the Pupil Level Annual Schools Census – covering information relating to pupils' attainments, background and school from the Foundation Stage up to Key Stage 4 – the ambition was to use all of this information to inform predictions of group membership. This would allow the group membership of future cohorts to be predicted using the individual pupil data available for each future cohort.

However, after estimating such a model[25] for the cohorts completing KS4 in 2014-2017, it became clear that even with a full range of predictors, the model could explain only 6%-7% of the overall variation in group membership. While the model was more successful in predicting membership of group 1, for those not in group 1 the model was not able to accurately predict the likelihood of membership of each of the other groups. As such, when comparison was made of the average characteristics of the actual observed members of a group and the model-predicted members of the group, aside from group 1 the model was unable to accurately characterise the groups in terms of these observable characteristics. This suggests that unobservable characteristics play an important part in determining choice of group for otherwise observably similar students.

As discussed in the main text, Table 4 reflects this complex relationship between characteristics and group membership. There is a pattern of membership of group 1: compared to other groups, the pupils who choose to remain in education or training for two years post-16 are more likely to have higher attainment at KS4, less likely to

[25] A multinomial logistic regression model was estimated with the four possible groups as the values of the dependent variable. The predictors of the model were the same as used for the group 1 membership model, detailed in the next subsection.

have ever been eligible for FSM, less likely to ever have had Special Educational Needs, more likely to be fluent in Welsh, and more likely to be from a better off area. However, for groups 2, 3 and 4, the relationships between prior attainment and group membership and between socio-demographic characteristics and group membership are much less straightforward. It is for this reason that the initial model of group membership was a poor fit to the data.

If the first stage of the modelling resulted in a distribution of students across groups that poorly fitted the observable data, we could not be confident that it would accurately predict the group membership for future cohorts, which would also then undermine the future stages of the modelling (i.e. routes and attainments).

In light of this, a less complex modelling approach was adopted, developing and advancing the approach taken in previous models of potential RPA policies (see Hunt and McIntosh, 2007). As detailed in the main text, the approach uses the time-series of group membership and within-group composition to predict how many pupils in future cohorts will be in each group, and within each group, what the distribution of pupils will be in terms of their lifetime FSM eligibility and their prior attainment at KS4. This approach was able to provide a good fit of the number of students in each group for the observed data, providing confidence that the future predicted numbers are good estimates.

The rich individual information available in the National Pupil Database and Pupil Level Annual Schools Census data is still used to predict for current cohorts which pupils will be in group 1.[26] This prediction is then used to create a comparison group of students amongst those who voluntarily choose to remain in education or training for two additional years, rather than using all students in this group as the comparison group. We use those who are in group 1, but based on their observable individual, family, school and prior attainment characteristics, have lower than the median predicted probability of making this choice. Then within this comparison group we look at the qualification routes and attainment rates of students in cells defined by lifetime FSM eligibility status and whether they are above or below the key prior attainment threshold at KS4.

The importance of unobservable characteristics in determining pathways, attainments and the economic return to qualifications is taken into account through

[26] The model fit is improved relative to the multinomial approach, with 10% of the variation in group 1 membership explained by the variables included, compared to only 6%-7% when trying to explain group choice. The relatively low proportion of variation explained again highlights the importance of unobservable determinants of post-16 choice, hence it is important we try to account for this by adjusting attainment rates and economic valuations of qualifications in the later stages of the modelling.

the consideration of alternative qualification route distributions and also through scaling down the attainment rates and economic valuation of qualifications relative to the comparison group of students who are the same in terms of their prior attainment and lifetime FSM eligibility status but who chose to remain in education voluntarily.

Variables included as predictors of group 1 membership:

KS4 attainment: dummy variables for: 5A*-C, 5A*-G, GCSE English A*-C, GCSE Maths A*-C, GCSE Welsh A*-C, GCSE Science A*-C, KS4 points score.

KS3 attainment: dummy variables for higher than expected level and for lower than expected level in English, Welsh (first language), Welsh (Second language), Maths, Science, Design & Technology, Geography, History, ICT, Modern Foreign Languages, Music, and PE.

KS2 attainments: dummy variables for higher than expected level and for lower than expected level in English, Welsh (first language), Welsh (Second language), Science, Maths.

Foundation stage profile: dummy variables for higher than expected level and for lower than expected level in English, Welsh, Maths and Science.

Individual characteristics: decile of Wales Index of Multiple Deprivation at KS4, non-Welsh national identity, ethnicity, ever FSM eligible, ever Special Educational Needs, ever Statemented SEN, ever English as an additional language. The following recorded at KS4, KS3 and KS2: fluent Welsh speaker, speaks no Welsh, studies Welsh as a first language.

School characteristics: the following recorded at KS4, KS3 and KS2: proportion of school eligible for FSM, Welsh medium school, other (non-English or Welsh) medium school, school size. For KS2 only: proportion eligible for free breakfasts.

Table A1: Actual and predicted participation in year 12 and year 13, by KS4 year and gender

Boys		**year 12**				**year 13**			
KS4 year	*N*	*actual*	*predicted*	*policy effect %*	*policy effect no.*	*actual*	*predicted*	*policy effect %*	*policy effect no.*
2014	17,203	91.36	91.36	8.64	1,487	81.43	81.83	18.17	3,126
2015	16,526	90.97	91.05	8.95	1,479	81.56	81.31	18.69	3,089
2016	15,942	90.90	90.75	9.25	1,475	81.48	80.78	19.22	3,064
2017	15,647	90.36	90.44	9.56	1,496	79.71	80.26	19.74	3,089
2018	15,077		90.14	9.86	1,487		79.74	20.26	3,055
2019	15,417		89.83	10.17	1,568		79.21	20.79	3,205
2020	16,179		89.53	10.47	1,694		78.69	21.31	3,448
2021	16,409		89.22	10.78	1,769		78.17	21.83	3,583
2022	17,134		88.92	11.08	1,899		77.64	22.36	3,830

Girls		**year 12**				**year 13**			
KS4 year	*N*	*actual*	*predicted*	*policy effect %*	*policy effect no.*	*actual*	*predicted*	*policy effect %*	*policy effect no.*
2014	16,446	93.73	93.73	06.27	1,031	86.14	85.91	14.09	2,317
2015	15,887	93.42	93.43	06.57	1,044	85.06	85.41	14.59	2,317
2016	15,261	93.13	93.13	06.87	1,049	84.96	84.92	15.08	2,302
2017	14,955	92.83	92.82	07.18	1,073	84.51	84.42	15.58	2,330
2018	14,355		92.52	07.48	1,073		83.92	16.08	2,308
2019	14,833		92.22	07.78	1,154		83.42	16.58	2,459
2020	15,427		91.92	08.08	1,246		82.92	17.08	2,635
2021	15,574		91.62	08.38	1,305		82.42	17.58	2,737
2022	16,031		91.32	08.68	1,392		81.93	18.07	2,897

Table A2: Actual and predicted type of participation in year 12 and year 13, by KS4 year and gender

Boys		**Group 1**				**Group 2**			
KS4 year	*N*	*actual*	*predicted*	*actual*	*predicted*	*actual*	*predicted*	*actual*	*predicted*
2014	17,203	80.11	80.52	13,782	13,852	11.24	10.84	1,934	1,864
2015	16,526	80.38	80.07	13,283	13,232	10.60	10.98	1,751	1,815
2016	15,942	80.21	79.61	12,787	12,692	10.70	11.13	1,705	1,775
2017	15,647	78.66	79.16	12,308	12,386	11.70	11.28	1,831	1,765
2018	15,077		78.71		11,867		11.43		1,723
2019	15,417		78.26		12,065		11.58		1,785
2020	16,179		77.80		12,588		11.72		1,897
2021	16,409		77.35		12,692		11.87		1,948
2022	17,134		76.90		13,176		12.02		2,059
		Group 3				**Group 4**			
KS4 year	*N*	*actual*	*predicted*	*actual*	*predicted*	*actual*	*predicted*	*actual*	*predicted*
2014	17,203	7.33	7.33	1,261	1,262	1.31	1.31	226	225
2015	16,526	7.85	7.71	1,297	1,274	1.18	1.24	195	205
2016	15,942	7.82	8.09	1,247	1,289	1.27	1.17	203	186
2017	15,647	8.59	8.46	1,344	1,324	1.05	1.10	164	172
2018	15,077		8.84		1,332		1.03		155
2019	15,417		9.21		1,420		0.96		148
2020	16,179		9.59		1,551		0.89		144
2021	16,409		9.96		1,635		0.82		134
2022	17,134		10.34		1,771		0.75		128

Girls		Group 1				Group 2			
KS4 year	*N*	*actual*	*predicted*	*actual*	*predicted*	*actual*	*predicted*	*actual*	*predicted*
2014	16,446	85.08	84.92	13,993	13,965	8.65	8.81	1,422	1,449
2015	15,887	84.21	84.45	13,379	13,417	9.21	8.98	1,463	1,426
2016	15,261	83.96	83.99	12,813	12,817	9.17	9.14	1,399	1,395
2017	14,955	83.62	83.52	12,505	12,490	9.21	9.30	1,377	1,391
2018	14,355		83.05		11,923		9.47		1,359
2019	14,833		82.59		12,250		9.63		1,429
2020	15,427		82.12		12,669		9.80		1,511
2021	15,574		81.66		12,717		9.96		1,551
2022	16,031		81.19		13,016		10.12		1,623
		Group 3				**Group 4**			
KS4 year	*N*	*actual*	*predicted*	*actual*	*predicted*	*actual*	*predicted*	*actual*	*predicted*
2014	16,446	5.22	5.28	858	868	1.05	1.00	173	164
2015	15,887	5.73	5.61	911	891	0.84	0.96	134	153
2016	15,261	5.87	5.94	896	907	1.00	0.93	153	142
2017	14,955	6.29	6.28	940	939	0.89	0.90	133	134
2018	14,355		6.61		949		0.86		124
2019	14,833		6.95		1,030		0.83		123
2020	15,427		7.28		1,123		0.80		123
2021	15,574		7.62		1,186		0.77		119
2022	16,031		7.95		1,274		0.73		118

Table A3: Additional predicted participants by group and year, by gender

KS4 2020 year	Boys		Girls	
	Participate in year 12	**Participate in year 13**	**Participate in year 12**	**Participate in year 13**
Group 2	Already participating	1,897	Already participating	1,511
Group 3	1,551	1,551	1,123	1,123
Group 4	144	Already participating	123	Already participating
Increase	*1,695*	*3,448*	*1,246*	*2,634*

KS4 2021 year	Boys		Girls	
	Participate in year 12	**Participate in year 13**	**Participate in year 12**	**Participate in year 13**
Group 2	Already participating	1,947	Already participating	1,551
Group 3	1,635	1,635	1,186	1,186
Group 4	134	Already participating	119	Already participating
Increase	*1,769*	*3,582*	*1,305*	*2,737*

KS4 2022 year	Boys		Girls	
	Participate in year 12	**Participate in year 13**	**Participate in year 12**	**Participate in year 13**
Group 2	Already participating	2,059	Already participating	1,623
Group 3	1,771	1,771	1,274	1,274
Group 4	128	Already participating	118	Already participating
Increase	*1,899*	*3,830*	*1,392*	*2,897*

Table A4: Prior attainment and socio-demographic characteristics by group and gender

Boys

Group	5A*-G (GCSE/equiv)	5 A*-G GCSE	5 A*-C (GCSE/equiv)	5A*-C inc. EWM	5A*-A (GCSE/equiv)	GCSE 5 A*-C	A*-C MSciEW	Points	Capped points	GCSE Sci A*-C	GCSE Maths A*-C	GCSE Eng A*-C
1	0.9781	0.8655	0.8259	0.6076	0.1484	0.5744	0.5828	525.7015	343.0183	0.8807	0.7047	0.6710
2	0.9269	0.6978	0.6282	0.3167	0.0190	0.2652	0.2939	419.5218	295.8515	0.7710	0.4388	0.4087
3	0.7992	0.6163	0.5541	0.3284	0.0769	0.2916	0.3080	382.2086	270.0130	0.7606	0.4673	0.4438
4	0.8249	0.6126	0.5660	0.2995	0.0279	0.2399	0.2754	375.1251	271.2569	0.7504	0.4348	0.4284
Total	*0.9565*	*0.8257*	*0.7795*	*0.5497*	*0.1270*	*0.5157*	*0.5255*	*500.8351*	*331.1914*	*0.8595*	*0.6556*	*0.6238*

Girls

Group	5A*-G (GCSE/equiv)	5 A*-G GCSE	5 A*-C (GCSE/equiv)	5A*-C inc. EWM	5A*-A (GCSE/equiv)	GCSE 5 A*-C	A*-C MSciEW	Points	Capped points	GCSE Sci A*-C	GCSE Maths A*-C	GCSE Eng A*-C
1	0.9865	0.9226	0.8863	0.6705	0.2317	0.6947	0.6420	567.3167	360.8741	0.8911	0.6952	0.8133
2	0.9467	0.7784	0.6829	0.3473	0.0420	0.3469	0.3109	450.6890	310.3779	0.7730	0.3860	0.5719
3	0.8549	0.7336	0.6447	0.4341	0.1617	0.4531	0.4150	443.8881	302.4961	0.7817	0.5035	0.6269
4	0.8415	0.7115	0.6003	0.3373	0.0472	0.3304	0.3052	398.6351	284.2680	0.7212	0.4125	0.5736
Total	*0.9740*	*0.8972*	*0.8512*	*0.6244*	*0.2087*	*0.6467*	*0.5957*	*548.0483*	*352.2179*	*0.8736*	*0.6546*	*0.7796*

Based on cohorts completing KS4 in 2014-2017.

Boys

Group	FSM ever	EAL ever	SEN ever	SEN st. ever	Welsh Nat. ID	Fluent Welsh	No Welsh	Study W 1st lang.	Study W 2nd lang.
1	0.2501	0.0527	0.4350	0.0436	0.8789	0.1749	0.4208	0.1786	0.8214
2	0.4047	0.0396	0.5785	0.0461	0.8564	0.1354	0.4367	0.1354	0.8646
3	0.3676	0.0541	0.6007	0.1253	0.8149	0.1252	0.4049	0.1264	0.8736
4	0.3934	0.0479	0.6117	0.1066	0.8579	0.1247	0.4151	0.1210	0.8790
Total	*0.2782*	*0.0513*	*0.4660*	*0.0511*	*0.8711*	*0.1662*	*0.4213*	*0.1694*	*0.8306*

Group	White	Black	Asian	Mixed eth.	Other eth.
1	0.9373	0.0079	0.0234	0.0211	0.0103
2	0.9539	0.0049	0.0115	0.0215	0.0082
3	0.9412	0.0090	0.0160	0.0230	0.0109
4	0.9580	n/a	0.0153	0.0140	0.0089
Total	*0.9397*	*0.0076*	*0.0214*	*0.0212*	*0.0101*

Girls

Group	FSM ever	EAL ever	SEN ever	SEN st. ever	Welsh Nat. ID	Fluent Welsh	No Welsh	Study W 1st lang.	Study W 2nd lang.
1	0.2614	0.0479	0.2987	0.0151	0.8790	0.1917	0.3831	0.1937	0.8063
2	0.4460	0.0276	0.4473	0.0170	0.8541	0.1243	0.4175	0.1201	0.8799
3	0.3564	0.0543	0.4227	0.0574	0.7753	0.1082	0.3708	0.1152	0.8848
4	0.4115	0.0559	0.4266	0.0405	0.8094	0.1193	0.3667	0.1084	0.8916
Total	*0.2850*	*0.0465*	*0.3205*	*0.0180*	*0.8701*	*0.1803*	*0.3854*	*0.1820*	*0.8180*

Group	White	Black	Asian	Mixed eth.	Other eth.
1	0.9415	0.0072	0.0211	0.0206	0.0095
2	0.9610	0.0027	0.0104	0.0207	0.0051
3	0.9427	0.0075	0.0150	0.0236	0.0111
4	0.9425	n/a	0.0220	0.0237	0.0102
Total	*0.9433*	*0.0068*	*0.0198*	*0.0208*	*0.0092*

Based on cohorts completing KS4 in 2014-2017.

Deciles of the Welsh Index of Multiple Deprivation

Boys

Group	1	2	3	4	5	6	7	8	9	10	N
1	0.104	0.102	0.098	0.102	0.092	0.099	0.099	0.090	0.103	0.110	51,912
2	0.157	0.131	0.119	0.113	0.092	0.090	0.094	0.075	0.071	0.059	7,180
3	0.126	0.105	0.099	0.090	0.091	0.105	0.131	0.108	0.080	0.064	4,983
4	0.111	0.121	0.106	0.096	0.102	0.106	0.121	0.096	0.074	0.066	783
Total	*0.112*	*0.106*	*0.100*	*0.102*	*0.092*	*0.098*	*0.101*	*0.090*	*0.097*	*0.100*	*64,858*

Girls

Group	1	2	3	4	5	6	7	8	9	10	N
1	0.105	0.104	0.100	0.104	0.092	0.098	0.100	0.094	0.097	0.104	52,438
2	0.173	0.132	0.118	0.115	0.093	0.083	0.085	0.074	0.070	0.056	5,614
3	0.127	0.097	0.088	0.082	0.088	0.111	0.139	0.118	0.080	0.069	3,477
4	0.117	0.134	0.119	0.101	0.110	0.105	0.107	0.072	0.077	0.058	582
Total	*0.113*	*0.107*	*0.101*	*0.104*	*0.092*	*0.098*	*0.101*	*0.093*	*0.094*	*0.098*	*62,111*

Table A5: Additional predicted participants by year, variation by degree of compliance, by gender

KS4 2020 cohort	Boys		Girls	
Compliance	Additional participants in year 12	Additional participants in year 13	Additional participants in year 12	Additional participants in year 13
5%	85	172	62	132
15%	254	517	187	395
30%	509	1,034	374	790
50%	848	1,724	623	1,317
100%	1,695	3,448	1,246	2,634

KS4 2021 cohort	Boys		Girls	
Compliance	Additional participants in year 12	Additional participants in year 13	Additional participants in year 12	Additional participants in year 13
5%	88	179	65	137
15%	265	537	196	411
30%	531	1,075	392	821
50%	885	1,791	653	1,369
100%	1,769	3,582	1,305	2,737

KS4 2022 cohort	Boys		Girls	
Compliance	Additional participants in year 12	Additional participants in year 13	Additional participants in year 12	Additional participants in year 13
5%	95	192	70	145
15%	285	575	209	435
30%	570	1,149	418	869
50%	950	1,915	696	1,449
100%	1,899	3,830	1,392	2,897

Table A6: Predicted distribution of students across cells defined by lifetime FSM eligibility and prior attainment at age 16, by group, cohort completing KS4 in 2021

			proportion of group			
Boys	**proportion of cohort**	**number**	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**
Group 1	0.774	12,692	0.208	0.140	0.550	0.102
Group 2	0.119	1,948	0.353	0.315	0.210	0.122
Group 3	0.100	1,635	0.296	0.303	0.335	0.066
Group 4	0.008	134	0.369	0.328	0.238	0.065
	1.000	16,409				

			proportion of group			
Girls	**proportion of cohort**	**number**	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**
Group 1	0.817	12,717	0.183	0.113	0.584	0.120
Group 2	0.100	1,551	0.316	0.331	0.239	0.114
Group 3	0.076	1,186	0.292	0.257	0.387	0.063
Group 4	0.008	119	0.312	0.351	0.278	0.059
	1.000	15,574				

Table A7: Predicted distribution of students across cells defined by lifetime FSM eligibility and prior attainment at age 16, by group, cohort completing KS4 in 2022

			proportion of group			
Boys	**proportion of cohort**	**number**	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**
Group 1	0.769	13,176	0.203	0.137	0.556	0.104
Group 2	0.120	2,059	0.353	0.314	0.204	0.130
Group 3	0.103	1,771	0.287	0.299	0.345	0.070
Group 4	0.007	128	0.369	0.328	0.238	0.065
	1.000	17,134				

			proportion of group			
Girls	**proportion of cohort**	**number**	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**
Group 1	0.812	13,016	0.183	0.107	0.589	0.121
Group 2	0.101	1,623	0.318	0.327	0.237	0.117
Group 3	0.079	1,274	0.296	0.250	0.390	0.064
Group 4	0.007	118	0.312	0.351	0.278	0.059
	1.000	16,031				

Table A8: Predicted number of students in each cell defined by lifetime FSM eligibility status and prior attainment at age 16, by group, cohort completing KS4 in 2021

	number of students				
Boys	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**	**Total**
Group 1	2,634	1,783	6,979	1,296	**12,692**
Group 2	688	615	408	237	**1,948**
Group 3	484	495	548	107	**1,635**
Group 4	49	44	32	9	**134**
Total	*3,856*	*29,36*	*7,967*	*1,650*	***16,409***

	number of students				
Girls	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**	**Total**
Group 1	2,324	1,438	7,426	1,529	**12,717**
Group 2	490	513	371	177	**1,551**
Group 3	347	305	459	75	**1,186**
Group 4	37	42	33	7	**119**
Total	*3,198*	*2,298*	*8,290*	*1,788*	***15,574***

Notes: these are predictions of how many of the KS4 2021 cohort will be in each group (defined by FSM eligibility and prior attainment at age 16). For KS4 2021 this prior attainment information is not known in the data, hence this is all predicted based on the model.

Table A9: Predicted number of students in each cell defined by lifetime FSM eligibility status and prior attainment at age 16, by group, cohort completing KS4 in 2022

	number of students				
Boys	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**	**Total**
Group 1	2,672	1,808	7,325	1,370	**13,176**
Group 2	726	646	420	267	**2059**
Group 3	508	529	610	124	**1,771**
Group 4	47	42	30	8	**128**
Total	*3,953*	*3,025*	*8,386*	*1,769*	***17,134***

	number of students				
Girls	**low attainment, never FSM**	**low attainment, ever FSM**	**higher attainment, never FSM**	**higher attainment, ever FSM**	**Total**
Group 1	2,378	1,394	7,667	1,578	**13,016**
Group 2	516	531	385	190	**1,623**
Group 3	378	319	496	81	**1,274**
Group 4	37	41	33	7	**118**
Total	*3,309*	*2,285*	*8,581*	*1,856*	***16,031***

Notes: these are predictions of how many of the KS4 2022 cohort will be in each group (defined by FSM eligibility and prior attainment at age 16). For KS4 2022 this prior attainment information is not known in the data, hence this is all predicted based on the model.

Table A10: Distribution of students across qualification routes by cell defined by lifetime FSM eligibility status and prior attainment at 16; cohort completing KS4 in 2021

Boys

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	258	50	107	119	90	375	191	**1,191**
lower attainment, ever FSM	449	36	58	58	38	363	121	**1,123**
higher attainment, never FSM	23	5	43	433	185	77	188	**954**
higher attainment, ever FSM	25	2	15	123	66	38	77	**347**
Total	*754*	*92*	*224*	*733*	*380*	*853*	*578*	***3,614***
Proportion on route	0.2087	0.0255	0.0620	0.2027	0.1052	0.2360	0.1598	1.0000
In addition to 3,614 group 2, 3 and 4 students there are 102 from group 3 who we assume are in jobs that convert to level 2 apprenticeships which gives the total additional participants of **3,717** (rounding up).								**3,717**

Girls

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	115	51	66	166	78	183	194	**852**
lower attainment, ever FSM	254	34	56	80	51	219	146	**841**
higher attainment, never FSM	11	4	22	507	134	22	135	**835**
higher attainment, ever FSM	11	2	10	114	47	11	60	**254**
Total	*392*	*91*	*154*	*867*	*309*	*436*	*534*	***2,782***
Proportion on route	0.1408	0.0326	0.0553	0.3114	0.1112	0.1567	0.1920	1.0000
In addition to 2,782 group 2, 3 and 4 students there are 74 from group 3 who we assume are in jobs that convert to level 2 apprenticeships which gives the total additional participants of **2,857** (rounding up).								**2,857**

Table A11: Distribution of students across qualification routes by cell defined by lifetime FSM eligibility status and prior attainment at 16; cohort completing KS4 in 2022

Boys

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	271	52	112	125	95	394	201	**1,250**
lower attainment, ever FSM	473	38	61	61	40	383	128	**1,184**
higher attainment, never FSM	24	6	47	464	199	82	202	**1,023**
higher attainment, ever FSM	28	2	17	139	75	43	87	**391**
Total	*796*	*97*	*238*	*789*	*409*	*902*	*617*	***3,848***
Proportion on route	0.2070	0.0253	0.0618	0.2050	0.1062	0.2344	0.1604	1.0000
In addition to 3,848 group 2, 3 and 4 students there are 111 from group 3 who we assume are in jobs that convert to level 2 apprenticeships which gives the total additional participants of **3,958.**								**3,958**

Girls

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	123	54	70	176	83	195	206	907
lower attainment, ever FSM	263	35	58	83	53	227	151	871
higher attainment, never FSM	12	4	23	536	142	23	143	883
higher attainment, ever FSM	12	2	10	123	50	12	64	274
Total	410	96	162	918	328	458	564	2,935
Proportion on route	0.1396	0.0326	0.0552	0.3128	0.1116	0.1559	0.1923	1.0000
In addition to 2,935 group 2, 3 and 4 students there are 80 from group 3 who we assume are in jobs that convert to level 2 apprenticeships which gives the total additional participants of **3,015.**								**3,015**

Table A12: Distribution of students across qualification routes, variation by degree of compliance; cohort completing KS4 in 2021

Boys

Compliance	Sub level 2	GCSEs	Other level 2	A/AS-levels	Other level 3	Mixed max level 2	Mixed max level 3	Total
5%	38	5	11	37	19	43	29	**181**
15%	113	14	34	110	57	128	87	**542**
30%	226	28	67	220	114	256	173	**1,084**
50%	377	46	112	367	190	427	289	**1,807**
100%	754	92	224	733	380	853	578	**3,614**

Girls

Compliance	Sub level 2	GCSEs	Other level 2	A/AS-levels	Other level 3	Mixed max level 2	Mixed max level 3	Total
5%	20	5	8	43	15	22	27	**139**
15%	59	14	23	130	46	65	80	**417**
30%	118	27	46	260	93	131	160	**835**
50%	196	46	77	434	155	218	267	**1,391**
100%	392	91	154	867	309	436	534	**2,782**

Table A13: Distribution of students across qualification routes, variation by degree of compliance; cohort completing KS4 in 2022

Boys

Compliance	Sub level 2	GCSEs	Other level 2	A/AS-levels	Other level 3	Mixed max level 2	Mixed max level 3	Total
5%	40	5	12	39	20	45	31	**192**
15%	119	15	36	118	61	135	93	**577**
30%	239	29	71	237	123	271	185	**1,154**
50%	398	49	119	395	205	451	309	**1,924**
100%	796	97	238	789	409	902	617	**3,848**

Girls

Compliance	Sub level 2	GCSEs	Other level 2	A/AS-levels	Other level 3	Mixed max level 2	Mixed max level 3	Total
5%	21	5	8	46	16	23	28	**147**
15%	62	14	24	138	49	69	85	**440**
30%	123	29	49	275	98	137	169	**881**
50%	205	48	81	459	164	229	282	**1,468**
100%	410	96	162	918	328	458	564	**2,935**

Table A14: Attainments by lifetime FSM eligibility status, prior attainment at age 16 and qualifications route, based on comparison group from cohort completing KS4 in 2017

Boys

	lower attainment, never FSM								lower attainment, ever FSM						
	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3		Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3
2+ A/AS-level	0.00	n/a	n/a	0.28	0.00	0.00	0.03	2+ A/AS-level	0.00	n/a	n/a	0.19	0.00	0.00	n/a
5 GCSEs inc E/M	0.12	0.69	n/a	0.15	0.09	0.37	0.46	5 GCSEs inc E/M	0.07	0.64	n/a	0.22	n/a	0.30	0.45
C&G level 3	0.00	0.03	0.00	0.00	n/a	0.01	n/a	C&G level 3	0.00	0.00	0.00	0.00	0.00	0.01	n/a
BTEC level 3	0.00	0.52	0.00	0.37	1.18	0.04	0.51	BTEC level 3	0.00	0.50	n/a	0.51	1.22	0.04	0.42
Other voc. level 3	0.00	0.03	0.00	0.02	n/a	0.00	0.04	Other voc. level 3	0.00	n/a	0.00	0.00	0.00	0.01	0.05
C&G level 2	0.04	0.13	0.71	0.00	n/a	0.41	0.12	C&G level 2	0.03	0.15	0.51	n/a	0.00	0.41	0.09
BTEC level 2	0.00	n/a	0.04	0.00	0.00	0.00	0.02	BTEC level 2	0.00	n/a	0.00	0.00	0.00	0.01	n/a
Other voc. level 2	0.02	0.19	0.16	0.00	0.00	0.17	0.15	Other voc. level 2	0.01	0.17	0.22	0.00	0.00	0.16	0.16
Apprenticeship level 3	0.00	0.00	0.00	0.00	0.07	0.02	n/a	Apprenticeship level 3	0.00	0.00	0.00	0.00	0.00	0.01	n/a
Apprenticeship level 2	0.03	n/a	0.74	0.00	n/a	0.16	0.05	Apprenticeship level 2	0.02	n/a	0.51	0.00	n/a	0.09	n/a

Boys

	higher attainment, never FSM								higher attainment, ever FSM						
	Sub Level 2	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**		**Sub Level 2**	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**
2+ A/AS-level	0.00	n/a	n/a	0.59	n/a	n/a	0.09	2+ A/AS-level	0.00	n/a	0.00	0.61	n/a	n/a	0.15
5 GCSEs inc E/M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5 GCSEs inc E/M	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C&G level 3	0.00	0.00	n/a	0.00	0.06	n/a	0.04	C&G level 3	0.00	0.00	0.00	0.00	n/a	n/a	n/a
BTEC level 3	0.00	1.00	n/a	0.17	1.34	0.04	0.40	BTEC level 3	n/a	0.89	0.00	0.11	1.33	0.00	0.33
Other voc. level 3	0.00	0.00	n/a	0.01	0.02	n/a	0.02	Other voc. level 3	0.00	0.00	0.00	0.00	n/a	0.00	n/a
C&G level 2	n/a	n/a	0.64	0.00	0.06	0.56	0.14	C&G level 2	0.00	n/a	0.33	0.00	n/a	0.58	0.08
BTEC level 2	0.00	0.00	n/a	0.00	0.00	0.00	0.00	BTEC level 2	0.00	0.00	n/a	0.00	0.00	0.00	n/a
Other voc. level 2	0.00	n/a	0.19	0.00	0.08	0.18	0.13	Other voc. level 2	n/a	0.00	0.67	0.00	0.07	0.22	0.10
Apprenticeship level 3	0.00	0.00	n/a	0.00	0.07	n/a	0.02	Apprenticeship level 3	0.00	0.00	n/a	0.00	n/a	n/a	n/a
Apprenticeship level 2	0.00	0.00	0.62	0.00	0.02	0.30	0.06	Apprenticeship level 2	0.00	n/a	0.40	0.00	0.00	n/a	0.06

Girls

	lower attainment, never FSM							lower attainment, ever FSM						
	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3		Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3
2+ A/AS-level	0.00	0.05	n/a	0.44	0.00	0.00	0.08	2+ A/AS-level	0.00	0.03	0.00	0.38	0.00	0.00	0.03
5 GCSEs inc E/M	0.14	0.65	n/a	0.17	0.23	0.39	0.41	5 GCSEs inc E/M	0.12	0.54	0.08	0.13	0.15	0.29	0.33
C&G level 3	n/a	0.03	n/a	0.00	n/a	0.00	0.02	C&G level 3	0.00	0.03	n/a	0.00	n/a	0.01	0.03
BTEC level 3	n/a	0.56	n/a	0.21	0.79	0.07	0.40	BTEC level 3	0.01	0.33	0.00	0.47	0.85	0.06	0.24
Other voc. level 3	0.00	0.03	0.00	0.03	0.26	0.00	0.09	Other voc. level 3	0.00	0.04	0.00	n/a	0.21	0.01	0.09
C&G level 2	0.03	0.07	0.48	n/a	0.00	0.24	0.06	C&G level 2	0.01	0.07	0.47	n/a	0.00	0.18	0.06
BTEC level 2	n/a	0.02	0.00	0.00	0.00	0.01	0.00	BTEC level 2	0.00	0.00	n/a	0.00	0.00	0.01	0.00
Other voc. level 2	0.04	0.23	0.11	0.00	n/a	0.21	0.21	Other voc. level 2	0.04	0.34	0.37	0.00	0.00	0.32	0.31
Apprenticeship level 3	0.00	0.00	n/a	0.00	0.08	0.00	0.02	Apprenticeship level 3	0.00	0.00	0.00	n/a	n/a	0.00	n/a
Apprenticeship level 2	0.04	0.00	0.59	0.00	n/a	0.08	0.02	Apprenticeship level 2	0.02	0.00	0.38	0.00	0.00	0.04	0.04

Girls

	higher attainment, never FSM								higher attainment, ever FSM						
	Sub Level 2	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**		**Sub Level 2**	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**
2+ A/AS-level	n/a	n/a	n/a	0.75	0.00	0.12	0.26	2+ A/AS-level	0.00	n/a	n/a	0.70	n/a	0.00	0.23
5 GCSEs inc E/M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5 GCSEs inc E/M	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C&G level 3	0.00	0.00	0.00	0.00	0.05	0.00	0.03	C&G level 3	0.00	0.00	0.00	0.00	0.05	0.00	n/a
BTEC level 3	n/a	0.71	0.00	0.06	1.28	0.17	0.40	BTEC level 3	n/a	0.57	0.00	0.10	1.36	n/a	0.33
Other voc. level 3	0.00	n/a	0.00	0.01	0.08	0.00	0.04	Other voc. level 3	0.00	n/a	n/a	0.00	0.07	n/a	0.05
C&G level 2	0.00	0.00	0.33	0.00	0.00	0.26	0.07	C&G level 2	n/a	0.00	n/a	0.00	n/a	0.36	0.05
BTEC level 2	0.00	0.00	n/a	0.00	0.00	n/a	n/a	BTEC level 2	0.00	0.00	n/a	0.00	0.00	0.00	n/a
Other voc. level 2	n/a	n/a	0.33	0.00	0.00	0.29	0.10	Other voc. level 2	n/a	n/a	0.40	0.00	n/a	0.24	0.18
Apprenticeship level 3	0.00	0.00	n/a	0.00	0.03	0.00	0.02	Apprenticeship level 3	0.00	0.00	0.00	0.00	n/a	0.00	n/a
Apprenticeship level 2	0.00	0.00	0.48	0.00	0.00	0.21	0.04	Apprenticeship level 2	n/a	0.00	n/a	0.00	0.00	n/a	n/a

Note: values suppressed for statistical disclosure purposes where column size and cell N are below 5.

Table A15: Distribution of Group 2 students across qualification routes by cell defined by lifetime FSM eligibility status and prior attainment at 16, for just year 12; based on cohorts completing KS4 in 2014-2017

Boys

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	0.4624	0.0662	0.2110	0.1219	0.0562	0.0520	0.0304	1.0000
lower attainment, ever FSM	0.6457	0.0455	0.1293	0.0748	0.0426	0.0405	0.0215	1.0000
higher attainment, never FSM	0.0795	0.0075	0.0849	0.6064	0.1627	0.0103	0.0488	1.0000
higher attainment, ever FSM	0.1626	0.0099	0.1253	0.4737	0.1591	0.0155	0.0540	1.0000

Girls

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	0.2804	0.0836	0.2603	0.1891	0.0811	0.0482	0.0573	1.0000
lower attainment, ever FSM	0.5084	0.0547	0.1880	0.1018	0.0480	0.0619	0.0371	1.0000
higher attainment, never FSM	0.0341	0.0049	0.0781	0.6087	0.2041	0.0087	0.0613	1.0000
higher attainment, ever FSM	0.0536	n/a	0.1106	0.4939	0.2309	n/a	0.0842	1.0000

Note: values suppressed for statistical disclosure purposes where row size and cell N are below 5.

Table A16: Distribution of Group 4 students across qualification routes by cell defined by lifetime FSM eligibility status and prior attainment at 16, for just year 12; based on cohorts completing KS4 in 2014-2017

Boys

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	0.3754	0.0448	0.3102	0.1011	0.1051	n/a	n/a	1.0000
lower attainment, ever FSM	0.6295	0.0622	0.1804	0.0323	n/a	0.0610	n/a	1.0000
higher attainment, never FSM	0.0532	n/a	0.2531	0.3113	0.3198	n/a	0.0395	1.0000
higher attainment, ever FSM	0.1234	n/a	0.3040	0.2925	0.2456	n/a	n/a	1.0000

Girls

	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3	Total
lower attainment, never FSM	0.3087	0.0974	0.2710	0.1173	0.0968	0.0489	0.0598	1.0000
lower attainment, ever FSM	0.5173	0.0842	0.2228	0.0445	0.0733	n/a	n/a	1.0000
higher attainment, never FSM	0.0474	n/a	0.1314	0.4150	0.3788	n/a	n/a	1.0000
higher attainment, ever FSM	0.1444	n/a	0.2048	0.2937	0.2159	n/a	n/a	1.0000

Note: values suppressed for statistical disclosure purposes where row size and cell N are below 5.

Table A17: attainment matrix Group 2 absent RPA, based on cohort completing KS4 in 2017

Boys

	lower attainment, never FSM								lower attainment, ever FSM						
	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3		Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3
2+ A/AS-level	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2+ A/AS-level	0.00	0.00	0.00	n/a	0.00	0.00	0.00
GCSEs	0.03	0.48	0.08	0.09	n/a	0.50	0.45	GCSEs	n/a	0.47	n/a	n/a	0.00	0.24	0.30
C&G level 3	0.00	0.00	n/a	0.00	n/a	0.00	0.00	C&G level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BTEC level 3	0.00	0.00	0.00	n/a	0.24	0.00	n/a	BTEC level 3	0.00	0.00	0.00	0.14	n/a	0.00	n/a
Other voc. level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Other voc. level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C&G level 2	n/a	0.10	0.17	0.00	0.00	0.08	0.00	C&G level 2	0.00	n/a	0.12	0.00	0.00	0.00	0.00
BTEC level 2	0.00	0.00	0.07	0.00	0.00	0.00	0.00	BTEC level 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other voc. level 2	n/a	0.10	0.08	0.00	n/a	n/a	0.00	Other voc. level 2	0.00	n/a	0.16	0.00	0.00	n/a	n/a
Apprenticeship level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Apprenticeship level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apprenticeship level 2	0.00	0.00	0.07	0.00	0.00	n/a	n/a	Apprenticeship level 2	0.00	0.00	n/a	0.00	0.00	0.00	0.00

Boys

	higher attainment, never FSM							higher attainment, ever FSM						
	Sub Level 2	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**		**Sub Level 2**	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**
2+ A/AS-level	0.00	0.00	0.00	0.10	0.00	n/a	n/a	2+ A/AS-level	0.00	n/a	0.00	n/a	0.00	n/a	0.00
GCSEs	0.00	0.00	0.00	0.00	0.00	n/a	0.00	GCSEs	0.00	n/a	0.00	0.00	0.00	n/a	0.00
C&G level 3	0.00	0.00	0.00	0.00	0.00	n/a	0.00	C&G level 3	0.00	n/a	0.00	0.00	0.00	n/a	0.00
BTEC level 3	0.00	0.00	n/a	0.05	0.18	n/a	0.00	BTEC level 3	0.00	n/a	0.00	0.00	n/a	n/a	n/a
Other voc. level 3	0.00	0.00	0.00	0.00	0.00	n/a	n/a	Other voc. level 3	0.00	n/a	0.00	0.00	n/a	n/a	0.00
C&G level 2	n/a	0.00	0.22	0.00	n/a	n/a	0.00	C&G level 2	n/a	n/a	n/a	0.00	0.00	n/a	0.00
BTEC level 2	0.00	n/a	n/a	0.00	n/a	n/a	0.00	BTEC level 2	0.00	n/a	0.00	0.00	0.00	n/a	0.00
Other voc. level 2	0.00	n/a	n/a	0.00	n/a	n/a	n/a	Other voc. level 2	0.00	n/a	0.00	0.00	0.00	n/a	0.00
Apprenticeship level 3	0.00	0.00	0.00	0.00	0.00	n/a	0.00	Apprenticeship level 3	0.00	n/a	0.00	0.00	0.00	n/a	0.00
Apprenticeship level 2	0.00	0.00	n/a	0.00	0.00	n/a	0.00	Apprenticeship level 2	0.00	n/a	n/a	0.00	0.00	n/a	0.00

Girls

	lower attainment, never FSM								lower attainment, ever FSM						
	Sub Level 2	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**		**Sub Level 2**	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**
2+ A/AS-level	0.00	0.00	0.00	n/a	0.00	0.00	n/a	2+ A/AS-level	0.00	0.00	0.00	n/a	0.00	0.00	n/a
GCSEs	n/a	0.38	n/a	n/a	n/a	0.33	0.30	GCSEs	n/a	0.53	0.07	n/a	0.00	0.35	0.34
C&G level 3	0.00	0.00	0.00	0.00	0.00	0.00	n/a	C&G level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BTEC level 3	0.00	0.00	0.00	0.00	0.38	0.00	0.14	BTEC level 3	0.00	n/a	0.00	n/a	0.26	0.00	0.24
Other voc. level 3	0.00	0.00	0.00	n/a	0.00	0.00	0.00	Other voc. level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C&G level 2	0.00	n/a	0.11	0.00	0.00	0.00	0.00	C&G level 2	0.00	n/a	0.10	0.00	0.00	n/a	0.00
BTEC level 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	BTEC level 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other voc. level 2	n/a	0.24	0.26	0.00	0.00	n/a	0.00	Other voc. level 2	0.00	0.16	0.27	0.00	0.00	n/a	n/a
Apprenticeship level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Apprenticeship level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apprenticeship level 2	0.00	0.00	n/a	0.00	0.00	n/a	0.00	Apprenticeship level 2	0.00	0.00	n/a	0.00	0.00	0.00	n/a

Girls

	higher attainment, never FSM							higher attainment, ever FSM						
	Sub Level 2	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**		**Sub Level 2**	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**
2+ A/AS-level	0.00	n/a	0.00	0.16	0.00	n/a	0.17	2+ A/AS-level	n/a	n/a	0.00	0.12	0.00	n/a	0.00
GCSEs	0.00	n/a	0.00	0.00	0.00	n/a	0.00	GCSEs	n/a	n/a	0.00	0.00	0.00	n/a	0.00
C&G level 3	0.00	n/a	0.00	0.00	n/a	n/a	0.00	C&G level 3	n/a	n/a	0.00	0.00	0.00	n/a	0.00
BTEC level 3	0.00	n/a	0.00	0.03	0.25	n/a	n/a	BTEC level 3	n/a	n/a	0.00	n/a	0.33	n/a	0.00
Other voc. level 3	0.00	n/a	0.00	0.00	0.00	n/a	0.00	Other voc. level 3	n/a	n/a	0.00	0.00	0.00	n/a	0.00
C&G level 2	0.00	n/a	n/a	0.00	0.00	n/a	n/a	C&G level 2	n/a	n/a	n/a	0.00	0.00	n/a	0.00
BTEC level 2	0.00	n/a	0.00	0.00	0.00	n/a	0.00	BTEC level 2	n/a	n/a	0.00	0.00	0.00	n/a	0.00
Other voc. level 2	0.00	n/a	0.22	0.00	n/a	n/a	n/a	Other voc. level 2	n/a	n/a	n/a	0.00	0.00	n/a	n/a
Apprenticeship level 3	0.00	n/a	0.00	0.00	n/a	n/a	0.00	Apprenticeship level 3	n/a	n/a	0.00	0.00	0.00	n/a	0.00
Apprenticeship level 2	0.00	n/a	n/a	0.00	0.00	n/a	0.00	Apprenticeship level 2	n/a	n/a	0.00	0.00	0.00	n/a	0.00

Note: values suppressed for statistical disclosure purposes where column size and cell N are below 5.

Table A18: attainment matrix Group 4 absent RPA, based on cohorts completing KS4 in 2016 and 2017

Boys

	lower attainment, never FSM								lower attainment, ever FSM						
	Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3		Sub Level 2	GCSEs	Other Level 2	A/AS-levels	Other level 3	Mixed, max level 2	Mixed, max level 3
2+ A/AS-level	0.00	0.00	0.00	0.00	0.00	0.00	n/a	2+ A/AS-level	0.00	0.00	0.00	n/a	n/a	0.00	n/a
GCSEs	0.00	0.56	n/a	n/a	0.00	n/a	n/a	GCSEs	n/a	n/a	0.00	n/a	n/a	n/a	n/a
C&G level 3	0.00	0.00	0.00	0.00	0.00	0.00	n/a	C&G level 3	0.00	0.00	0.00	n/a	n/a	0.00	n/a
BTEC level 3	0.00	0.00	0.00	n/a	n/a	0.00	n/a	BTEC level 3	0.00	0.00	0.00	n/a	n/a	0.00	n/a
Other voc. level 3	0.00	0.00	0.00	0.00	0.00	0.00	n/a	Other voc. level 3	0.00	0.00	0.00	n/a	n/a	0.00	n/a
C&G level 2	0.00	0.00	0.46	0.00	0.00	0.00	n/a	C&G level 2	0.00	n/a	n/a	n/a	n/a	0.00	n/a
BTEC level 2	0.00	0.00	n/a	0.00	0.00	0.00	n/a	BTEC level 2	0.00	0.00	0.00	n/a	n/a	0.00	n/a
Other voc. level 2	0.00	0.00	n/a	0.00	0.00	n/a	n/a	Other voc. level 2	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Apprenticeship level 3	0.00	0.00	0.00	0.00	0.00	0.00	n/a	Apprenticeship level 3	0.00	0.00	0.00	n/a	n/a	0.00	n/a
Apprenticeship level 2	0.00	0.00	0.43	0.00	0.00	0.00	n/a	Apprenticeship level 2	0.00	0.00	0.30	n/a	n/a	0.00	n/a

Boys

	higher attainment, never FSM							higher attainment, ever FSM						
	Sub Level 2	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**		**Sub Level 2**	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**
2+ A/AS-level	0.00	n/a	0.00	0.32	n/a	n/a	0.00	2+ A/AS-level	n/a	n/a	0.00	0.00	0.00	n/a	n/a
GCSEs	0.00	n/a	0.00	0.00	0.00	n/a	0.00	GCSEs	n/a	n/a	0.00	0.00	0.00	n/a	n/a
C&G level 3	0.00	n/a	0.00	0.00	n/a	n/a	0.00	C&G level 3	n/a	n/a	0.00	0.00	0.00	n/a	n/a
BTEC level 3	0.00	n/a	0.00	0.00	0.33	n/a	n/a	BTEC level 3	n/a	n/a	0.00	n/a	n/a	n/a	n/a
Other voc. level 3	0.00	n/a	0.00	0.00	n/a	n/a	0.00	Other voc. level 3	n/a	n/a	0.00	0.00	0.00	n/a	n/a
C&G level 2	0.00	n/a	0.34	0.00	0.00	n/a	n/a	C&G level 2	n/a	n/a	0.56	0.00	0.00	n/a	n/a
BTEC level 2	0.00	n/a	n/a	0.00	0.00	n/a	0.00	BTEC level 2	n/a	n/a	0.00	0.00	0.00	n/a	n/a
Other voc. level 2	0.00	n/a	0.17	0.00	n/a	n/a	0.00	Other voc. level 2	n/a	n/a	0.00	0.00	0.00	n/a	n/a
Apprenticeship level 3	0.00	n/a	0.00	0.00	0.15	n/a	0.00	Apprenticeship level 3	n/a	n/a	0.00	0.00	n/a	n/a	n/a
Apprenticeship level 2	0.00	n/a	0.49	0.00	n/a	n/a	0.00	Apprenticeship level 2	n/a	n/a	n/a	0.00	0.00	n/a	n/a

Girls

	lower attainment, never FSM								lower attainment, ever FSM						
	Sub Level 2	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**		**Sub Level 2**	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**
2+ A/AS-level	0.00	0.00	0.00	n/a	0.00	0.00	0.00	2+ A/AS-level	0.00	0.00	0.00	n/a	n/a	n/a	n/a
GCSEs	n/a	0.60	0.00	0.00	0.00	n/a	n/a	GCSEs	n/a	0.46	n/a	n/a	n/a	n/a	n/a
C&G level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C&G level 3	0.00	0.00	0.00	n/a	n/a	n/a	n/a
BTEC level 3	0.00	0.00	0.00	0.00	0.00	0.00	n/a	BTEC level 3	0.00	0.00	0.00	n/a	n/a	n/a	n/a
Other voc. level 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Other voc. level 3	0.00	0.00	0.00	n/a	n/a	n/a	n/a
C&G level 2	0.00	n/a	n/a	0.00	0.00	0.00	0.00	C&G level 2	0.00	0.00	n/a	n/a	n/a	n/a	n/a
BTEC level 2	0.00	0.00	n/a	0.00	0.00	0.00	0.00	BTEC level 2	0.00	0.00	0.00	n/a	n/a	n/a	n/a
Other voc. level 2	n/a	n/a	n/a	0.00	0.00	0.00	0.00	Other voc. level 2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Apprenticeship level 3	0.00	0.00	0.00	0.00	n/a	0.00	n/a	Apprenticeship level 3	0.00	0.00	0.00	n/a	n/a	n/a	n/a
Apprenticeship level 2	0.00	0.00	0.21	0.00	0.00	n/a	0.00	Apprenticeship level 2	0.00	0.00	0.25	n/a	n/a	n/a	n/a

Girls

	higher attainment, never FSM							higher attainment, ever FSM						
	Sub Level 2	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**		**Sub Level 2**	**GCSEs**	**Other Level 2**	**A/AS-levels**	**Other level 3**	**Mixed, max level 2**	**Mixed, max level 3**
2+ A/AS-level	n/a	n/a	0.00	0.17	0.00	n/a	n/a	2+ A/AS-level	n/a	n/a	0.00	0.00	n/a	n/a	n/a
GCSEs	n/a	n/a	0.00	0.00	0.00	n/a	n/a	GCSEs	n/a	n/a	0.00	0.00	n/a	n/a	n/a
C&G level 3	n/a	n/a	0.00	0.00	n/a	n/a	n/a	C&G level 3	n/a	n/a	0.00	0.00	n/a	n/a	n/a
BTEC level 3	n/a	n/a	0.00	0.00	0.47	n/a	n/a	BTEC level 3	n/a	n/a	0.00	0.00	n/a	n/a	n/a
Other voc. level 3	n/a	n/a	0.00	0.00	0.00	n/a	n/a	Other voc. level 3	n/a	n/a	0.00	0.00	n/a	n/a	n/a
C&G level 2	n/a	n/a	0.00	0.00	0.00	n/a	n/a	C&G level 2	n/a	n/a	n/a	0.00	n/a	n/a	n/a
BTEC level 2	n/a	n/a	n/a	0.00	0.00	n/a	n/a	BTEC level 2	n/a	n/a	0.00	0.00	n/a	n/a	n/a
Other voc. level 2	n/a	n/a	n/a	0.00	0.00	n/a	n/a	Other voc. level 2	n/a	n/a	n/a	0.00	n/a	n/a	n/a
Apprenticeship level 3	n/a	n/a	0.00	0.00	n/a	n/a	n/a	Apprenticeship level 3	n/a	n/a	0.00	0.00	n/a	n/a	n/a
Apprenticeship level 2	n/a	n/a	n/a	0.00	n/a	n/a	n/a	Apprenticeship level 2	n/a	n/a	n/a	0.00	n/a	n/a	n/a

Note: values suppressed for statistical disclosure purposes where column size and cell N are below 5.

Table A19: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario, cohort completing KS4 in 2021

Boys	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	42	34	8	39	0	39	3	3	0	**47**
5 GCSEs inc E/M	63	124	0	44	0	44	5	6	0	**44**
No. L3 C&G	4	5	0	4	0	4	0	0	0	**4**
No. L3 BTEC	104	53	51	87	0	87	7	9	0	**138**
No. L3 other vocational	4	3	2	4	0	4	0	1	0	**5**
No. L2 C&G	69	69	0	52	0	52	5	13	0	**52**
No. L2 BTEC	2	13	0	1	0	1	0	1	0	**1**
No. L2 other vocational	36	49	0	27	0	27	2	5	0	**27**
No. apprenticeships L3	5	0	5	4	0	4	0	2	0	**9**
No. apprenticeships L2	35	18	17	67	0	67	2	15	0	**83**

Girls	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	66	57	9	58	0	58	5	3	2	**69**
5 GCSEs inc English/Maths	51	98	0	31	0	31	4	8	0	**31**
No. L3 C&G	4	2	2	3	0	3	0	1	0	**5**
No. L3 BTEC	79	76	4	59	0	59	6	9	0	**62**
No. L3 other vocational	12	1	10	8	0	8	1	0	1	**19**
No. L2 C&G	24	35	0	16	0	16	2	2	0	**16**
No. L2 BTEC	1	0	1	1	0	1	0	1	0	**2**
No. L2 other vocational	36	98	0	23	0	23	3	7	0	**23**
No. apprenticeships L3	3	1	2	2	0	2	0	3	0	**4**
No. apprenticeships L2	15	9	6	40	0	40	1	8	0	**45**

Note: estimated attainments are based on historical attainment rates by cell multiplied by estimated number of students in each cell. Therefore predicted numbers of qualifications below 5 result from low numbers of students in the category and low attainment rates in that category. These are all predicted based on a model prediction of cell size, therefore do not correspond to actual individuals.

Table A20: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario, cohort completing KS4 in 2022

Boys	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	45	36	9	44	0	44	3	3	0	**52**
5 GCSEs inc E/M	67	131	0	47	0	47	4	6	0	**47**
No. L3 C&G	4	6	0	4	0	4	0	0	0	**4**
No. L3 BTEC	110	56	54	95	0	95	7	9	0	**149**
No. L3 other vocational	5	3	2	4	0	4	0	0	0	**6**
No. L2 C&G	72	73	0	56	0	56	5	13	0	**56**
No. L2 BTEC	2	14	0	1	0	1	0	1	0	**1**
No. L2 other vocational	38	52	0	29	0	29	2	5	0	**29**
No. apprenticeships L3	5	0	5	5	0	5	0	2	0	**10**
No. apprenticeships L2	37	19	17	72	0	72	2	14	0	**89**

Girls	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	69	59	10	63	0	63	5	3	2	**75**
5 GCSEs inc E/M	53	102	0	34	0	34	4	8	0	**34**
No. L3 C&G	4	2	2	3	0	3	0	1	0	**5**
No. L3 BTEC	83	79	4	63	0	63	6	9	0	**67**
No. L3 other vocational	12	2	11	9	0	9	1	0	1	**20**
No. L2 C&G	25	37	0	17	0	17	2	2	0	**17**
No. L2 BTEC	2	0	2	1	0	1	0	1	0	**3**
No. L2 other vocational	38	103	0	24	0	24	3	7	0	**24**
No. apprenticeships L3	3	1	2	2	0	2	0	3	0	**4**
No. apprenticeships L2	16	10	6	42	0	42	1	8	0	**49**

Note: estimated attainments are based on historical attainment rates by cell multiplied by estimated number of students in each cell. Therefore predicted numbers of qualifications below 5 result from low numbers of students in the category and low attainment rates in that category. These are all predicted based on a model prediction of cell size, therefore do not correspond to actual individuals.

Table A21: Estimated economic benefits of the RPA to 18 in Wales, central scenario, cohort completing KS4 in 2021

	Boys	Girls	Total
Economic benefits of the additional attainments of group 2 participants	£4,776,000	£2,029,000	£6,805,000
Economic benefits of the additional attainments of group 3 participants	£18,685,000	£12,068,000	£30,753,000
Economic benefits of the additional attainments of group 4 participants:	£1,414	£137,000	£138,000
Overall additional economic benefit	£23,462,000	£14,234,000	**£37,696,000**

Source: Combined data from all modelling stages.

Table A22: Estimated economic benefits of the RPA to 18 in Wales, central scenario, cohort completing KS4 in 2022

	Boys	Girls	Total
Economic benefits of the additional attainments of group 2 participants	£5,077,000	£2,132,000	£7,209,000
Economic benefits of the additional attainments of group 3 participants	£20,238,000	£12,988,000	£33,226,000
Economic benefits of the additional attainments of group 4 participants:	£1,350	£135,000	£136,000
Overall additional economic benefit	£25,317,000	£15,255,000	**£40,571,000**

Source: Combined data from all modelling stages.

Table A23: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario but with 5% compliance, cohort completing KS4 in 2020

Boys	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	7	34	0	6	0	6	0	4	0	**6**
5 GCSEs inc E/M	10	121	0	7	0	7	1	7	0	**7**
No. L3 C&G	1	5	0	1	0	1	0	0	0	**1**
No. L3 BTEC	17	52	0	14	0	14	1	10	0	**14**
No. L3 other vocational	1	3	0	1	0	1	0	1	0	**1**
No. L2 C&G	11	67	0	8	0	8	1	14	0	**8**
No. L2 BTEC	0	13	0	0	0	0	0	1	0	**0**
No. L2 other vocational	6	49	0	4	0	4	0	5	0	**4**
No. apprenticeships L3	7	34	0	6	0	6	0	4	0	**6**
No. apprenticeships L2	10	121	0	7	0	7	1	7	0	**7**

Girls	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	11	55	0	9	0	9	1	3	0	**9**
5 GCSEs inc E/M	8	95	0	5	0	5	1	9	0	**5**
No. L3 C&G	1	2	0	0	0	0	0	1	0	**0**
No. L3 BTEC	13	73	0	9	0	9	1	10	0	**9**
No. L3 other vocational	2	1	1	1	0	1	0	0	0	**2**
No. L2 C&G	4	35	0	2	0	2	0	2	0	**2**
No. L2 BTEC	0	0	0	0	0	0	0	1	0	**0**
No. L2 other vocational	6	96	0	4	0	4	0	7	0	**4**
No. apprenticeships L3	0	1	0	0	0	0	0	3	0	**0**
No. apprenticeships L2	2	9	0	29	0	29	0	8	0	**29**

Note: estimated attainments are based on historical attainment rates by cell multiplied by estimated number of students in each cell. Therefore predicted numbers of qualifications below 5 result from low numbers of students in the category and low attainment rates in that category. These are all predicted based on a model prediction of cell size, therefore do not correspond to actual individuals.

Table A24: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario but with 15% compliance, cohort completing KS4 in 2020

Boys	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	20	34	0	18	0	18	1	4	0	**18**
5 GCSEs inc E/M	31	121	0	21	0	21	2	7	0	**21**
No. L3 C&G	2	5	0	2	0	2	0	0	0	**2**
No. L3 BTEC	51	52	0	41	0	41	4	10	0	**41**
No. L3 other vocational	2	3	0	2	0	2	0	1	0	**2**
No. L2 C&G	33	67	0	25	0	25	3	14	0	**25**
No. L2 BTEC	1	13	0	1	0	1	0	1	0	**1**
No. L2 other vocational	17	49	0	13	0	13	1	5	0	**13**
No. apprenticeships L3	2	0	2	2	0	2	0	2	0	**4**
No. apprenticeships L2	17	18	0	51	0	51	1	16	0	**51**

Girls	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	32	55	0	27	0	27	3	3	0	**27**
5 GCSEs inc E/M	25	95	0	15	0	15	2	9	0	**15**
No. L3 C&G	2	2	0	1	0	1	0	1	0	**2**
No. L3 BTEC	38	73	0	28	0	28	3	10	0	**28**
No. L3 other vocational	6	1	4	4	0	4	0	0	0	**9**
No. L2 C&G	12	35	0	7	0	7	1	2	0	**7**
No. L2 BTEC	1	0	1	0	0	0	0	1	0	**1**
No. L2 other vocational	18	96	0	11	0	11	1	7	0	**11**
No. apprenticeships L3	1	1	0	1	0	1	0	3	0	**1**
No. apprenticeships L2	7	9	0	33	0	33	1	8	0	**33**

Note: estimated attainments are based on historical attainment rates by cell multiplied by estimated number of students in each cell. Therefore predicted numbers of qualifications below 5 result from low numbers of students in the category and low attainment rates in that category. These are all predicted based on a model prediction of cell size, therefore do not correspond to actual individuals.

Table A25: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario but with 50% compliance, cohort completing KS4 in 2020

Boys	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	68	34	34	60	0	60	5	4	1	**96**
5 GCSEs inc E/M	103	121	0	71	0	71	8	7	1	**73**
No. L3 C&G	7	5	1	6	0	6	1	0	0	**7**
No. L3 BTEC	169	52	117	136	0	136	13	10	3	**256**
No. L3 other vocational	7	3	5	6	0	6	1	1	0	**10**
No. L2 C&G	112	67	45	83	0	83	9	14	0	**128**
No. L2 BTEC	3	13	0	2	0	2	0	1	0	**2**
No. L2 other vocational	58	49	10	43	0	43	4	5	0	**52**
No. apprenticeships L3	8	0	8	7	0	7	1	2	0	**15**
No. apprenticeships L2	57	18	39	80	0	80	4	16	0	**119**

Girls	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	107	55	52	92	0	92	9	3	5	**148**
5 GCSEs inc E/M	83	95	0	50	0	50	7	9	0	**50**
No. L3 C&G	6	2	5	4	0	4	1	1	0	**9**
No. L3 BTEC	128	73	55	92	0	92	10	10	1	**148**
No. L3 other vocational	19	1	18	13	0	13	2	0	2	**32**
No. L2 C&G	39	35	4	25	0	25	3	2	1	**30**
No. L2 BTEC	2	0	2	2	0	2	0	1	0	**4**
No. L2 other vocational	59	96	0	36	0	36	5	7	0	**36**
No. apprenticeships L3	5	1	4	3	0	3	0	3	0	**7**
No. apprenticeships L2	25	9	16	44	0	44	2	8	0	**59**

Note: estimated attainments are based on historical attainment rates by cell multiplied by estimated number of students in each cell. Therefore predicted numbers of qualifications below 5 result from low numbers of students in the category and low attainment rates in that category. These are all predicted based on a model prediction of cell size, therefore do not correspond to actual individuals.

Table A26: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario but with 100% compliance, cohort completing KS4 in 2020

Boys	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	136	34	103	121	0	121	10	4	6	**230**
5 GCSEs inc E/M	206	121	84	143	0	143	16	7	10	**237**
No. L3 C&G	13	5	8	11	0	11	1	0	1	**20**
No. L3 BTEC	338	52	286	273	0	273	25	10	16	**574**
No. L3 other vocational	15	3	12	11	0	11	1	1	1	**24**
No. L2 C&G	223	67	156	166	0	166	17	14	3	**325**
No. L2 BTEC	7	13	0	4	0	4	0	1	0	**4**
No. L2 other vocational	116	49	68	85	0	85	9	5	4	**156**
No. apprenticeships L3	16	0	16	13	0	13	1	2	0	**29**
No. apprenticeships L2	113	18	95	123	0	123	9	16	0	**218**

Girls	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	214	55	158	183	0	183	17	3	14	**355**
5 GCSEs inc E/M	165	95	70	99	0	99	14	9	5	**174**
No. L3 C&G	13	2	11	9	0	9	1	1	0	**20**
No. L3 BTEC	256	73	183	185	0	185	20	10	11	**378**
No. L3 other vocational	38	1	37	26	0	26	3	0	3	**66**
No. L2 C&G	78	35	44	49	0	49	6	2	4	**97**
No. L2 BTEC	5	0	5	3	0	3	0	1	0	**8**
No. L2 other vocational	119	96	23	72	0	72	10	7	3	**98**
No. apprenticeships L3	9	1	8	7	0	7	1	3	0	**15**
No. apprenticeships L2	49	9	40	60	0	60	4	8	0	**100**

Note: estimated attainments are based on historical attainment rates by cell multiplied by estimated number of students in each cell. Therefore predicted numbers of qualifications below 5 result from low numbers of students in the category and low attainment rates in that category. These are all predicted based on a model prediction of cell size, therefore do not correspond to actual individuals.

Table A27: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario but with no academic routes, cohort completing KS4 in 2020

Boys	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	5	34	0	4	0	4	0	4	0	**4**
5 GCSEs inc E/M	54	121	0	38	0	38	4	7	0	**38**
No. L3 C&G	7	5	2	6	0	6	1	0	0	**9**
No. L3 BTEC	173	52	121	147	0	147	13	10	3	**271**
No. L3 other vocational	5	3	2	4	0	4	0	1	0	**7**
No. L2 C&G	75	67	8	56	0	56	6	14	0	**64**
No. L2 BTEC	2	13	0	1	0	1	0	1	0	**1**
No. L2 other vocational	39	49	0	30	0	30	3	5	0	**30**
No. apprenticeships L3	9	0	9	8	0	8	1	2	0	**17**
No. apprenticeships L2	42	18	24	69	0	69	3	16	0	**94**

Girls	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	8	55	0	6	0	6	1	3	0	**6**
5 GCSEs inc E/M	46	95	0	27	0	27	4	9	0	**27**
No. L3 C&G	8	2	6	6	0	6	1	1	0	**12**
No. L3 BTEC	159	73	86	128	0	128	13	10	3	**217**
No. L3 other vocational	21	1	20	15	0	15	2	0	2	**37**
No. L2 C&G	28	35	0	17	0	17	2	2	0	**17**
No. L2 BTEC	1	0	1	1	0	1	0	1	0	**2**
No. L2 other vocational	36	96	0	22	0	22	3	7	0	**22**
No. apprenticeships L3	6	1	5	4	0	4	0	3	0	**9**
No. apprenticeships L2	20	9	11	41	0	41	2	8	0	**52**

Note: estimated attainments are based on historical attainment rates by cell multiplied by estimated number of students in each cell. Therefore predicted numbers of qualifications below 5 result from low numbers of students in the category and low attainment rates in that category. These are all predicted based on a model prediction of cell size, therefore do not correspond to actual individuals.

Table A28: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario but with lower L3 routes, cohort completing KS4 in 2020

Boys	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	33	34	0	31	0	31	2	4	0	**31**
5 GCSEs inc E/M	67	121	0	46	0	46	5	7	0	**46**
No. L3 C&G	3	5	0	2	0	2	0	0	0	**2**
No. L3 BTEC	30	52	0	24	0	24	2	10	0	**24**
No. L3 other vocational	2	3	0	2	0	2	0	1	0	**2**
No. L2 C&G	112	67	46	87	0	87	9	14	0	**132**
No. L2 BTEC	3	13	0	2	0	2	0	1	0	**2**
No. L2 other vocational	50	49	2	36	0	36	4	5	0	**37**
No. apprenticeships L3	5	0	5	4	0	4	0	2	0	**10**
No. apprenticeships L2	63	18	45	89	0	89	5	16	0	**134**

Girls	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	49	55	0	45	0	45	4	3	1	**46**
5 GCSEs inc E/M	59	95	0	35	0	35	5	9	0	**35**
No. L3 C&G	2	2	0	1	0	1	0	1	0	**1**
No. L3 BTEC	32	73	0	22	0	22	3	10	0	**22**
No. L3 other vocational	3	1	2	2	0	2	0	0	0	**4**
No. L2 C&G	48	35	14	32	0	32	4	2	2	**47**
No. L2 BTEC	4	0	4	3	0	3	0	1	0	**6**
No. L2 other vocational	55	96	0	36	0	36	5	7	0	**36**
No. apprenticeships L3	2	1	1	2	0	2	0	3	0	**2**
No. apprenticeships L2	33	9	24	52	0	52	3	8	0	**76**

Note: estimated attainments are based on historical attainment rates by cell multiplied by estimated number of students in each cell. Therefore predicted numbers of qualifications below 5 result from low numbers of students in the category and low attainment rates in that category. These are all predicted based on a model prediction of cell size, therefore do not correspond to actual individuals.

Table A29: Estimated net additional attainment of qualifications by RPA students under the policy, central scenario but with only 50% attainment rate, cohort completing KS4 in 2020

Boys	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	31	34	0	27	0	27	2	4	0	**27**
5 GCSEs inc E/M	46	121	0	32	0	32	4	7	0	**32**
No. L3 C&G	3	5	0	3	0	3	0	0	0	**3**
No. L3 BTEC	76	52	24	61	0	61	6	10	0	**85**
No. L3 other vocational	3	3	1	3	0	3	0	1	0	**3**
No. L2 C&G	50	67	0	37	0	37	4	14	0	**37**
No. L2 BTEC	1	13	0	1	0	1	0	1	0	**1**
No. L2 other vocational	26	49	0	19	0	19	2	5	0	**19**
No. apprenticeships L3	4	0	4	3	0	3	0	2	0	**7**
No. apprenticeships L2	25	18	8	48	0	48	2	16	0	**55**

Girls	Group 2			Group 3			Group 4			Total
	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Under RPA	Absent RPA	Net additional	Additional
2+ A/AS-levels	48	55	0	41	0	41	4	3	1	**42**
5 GCSEs inc E/M	37	95	0	22	0	22	3	9	0	**22**
No. L3 C&G	3	2	1	2	0	2	0	1	0	**3**
No. L3 BTEC	58	73	0	42	0	42	5	10	0	**42**
No. L3 other vocational	9	1	7	6	0	6	1	0	1	**14**
No. L2 C&G	18	35	0	11	0	11	1	2	0	**11**
No. L2 BTEC	1	0	1	1	0	1	0	1	0	**2**
No. L2 other vocational	27	96	0	16	0	16	2	7	0	**16**
No. apprenticeships L3	2	1	1	1	0	1	0	3	0	**2**
No. apprenticeships L2	11	9	2	28	0	28	1	8	0	**30**

Note: estimated attainments are based on historical attainment rates by cell multiplied by estimated number of students in each cell. Therefore predicted numbers of qualifications below 5 result from low numbers of students in the category and low attainment rates in that category. These are all predicted based on a model prediction of cell size, therefore do not correspond to actual individuals.

Author Details

Dr. Matt Dickson is Reader in Public Policy at the Institute for Policy Research, University of Bath, Research Fellow at the Institute of Labor Economics (IZA) Bonn, and a Research Affiliate of the Centre for Education Policy and Equalisaing Opportunities, UCL.

For further information please contact:
Manon Roberts
Wales Centre for Public Policy
+44 (0) 29 2087 5345
manon.roberts@wcpp.org.uk

Wales Centre
for Public Policy
Canolfan Polisi
Cyhoeddus Cymru