

1.1 Note on scope

While the effect of a number of different pupil characteristics will be both mentioned and discussed in this analysis, the main goal of the analysis is to compare educational attainment by medium. The effect of other characteristics will only be included to put differences by medium in context.

1.2 Note on data

Data used is from the Welsh Government's schools and pupils databases. It excludes pupils in special schools, pupils who are new to the Welsh and English educational system, and pupils educated privately within Wales.

The majority of pupils attend either Welsh or English medium schools, but there are also bilingual, dual-stream and transitional schools and schools classed as "English with significant Welsh". For the purposes of this analysis, pupils in bilingual, dual-stream and transitional schools are included with those in Welsh medium education, and those who attend schools which are "English with significant Welsh" are included with those in English medium education.

2.1 Characteristics of students from Welsh medium and English medium schools.

The intake of schools are not identical and there are some differences overall between the intake of Welsh medium and English medium schools. Some would be expected (e.g. differences in home language) while others may be unexpected.

Differences are discussed, firstly for all groups, then for each Local Authority group separately. There are three groups of Local Authorities, split according to the proportion of students educated through the medium of Welsh, following the groupings of the Welsh in education board. These are:

Group1:

Isle of Anglesey
Gwynedd

Group 2:

Conwy
Denbighshire
Powys
Ceredigion
Carmarthenshire
Pembrokeshire
Neath Port Talbot

Group 3:

Wrexham
Swansea
Vale of Glamorgan

Rhondda Cynon Taff
 Merthyr Tydfil
 Caerphilly
 Cardiff
 Flintshire
 Bridgend
 Blaenau Gwent
 Torfaen
 Monmouthshire
 Newport

FP and KS2 are combined (this is roughly equivalent to primary school students) and KS3 and 4 are also combined (roughly equivalent to secondary school).

2.2 Primary level, all groups

Overall, 24.5% of pupils were in Welsh medium education.

The biggest difference at a primary level was in the proportion of those who spoke Welsh at home, with 39.7% of those in Welsh medium schools speaking Welsh at home, but only 1.4% of those in English medium schools.

The next biggest difference was in the proportion of those eligible for free school meals, with 21.4% of those in English medium education eligible for free school meals, but only 13.2% of those in Welsh medium.

For the first two phases combined, there is little difference in the proportions of those who have special educational needs (26.0% in English medium and 25.3% in Welsh medium.) However, there are higher proportions of students with special educational needs in the Foundation Phase in English medium schools, and higher proportions of students with special educational needs in Key Stage 2 in Welsh medium schools.

There is a very slightly higher proportion of female pupils in Welsh medium schools (49.7% compared to 48.6%).

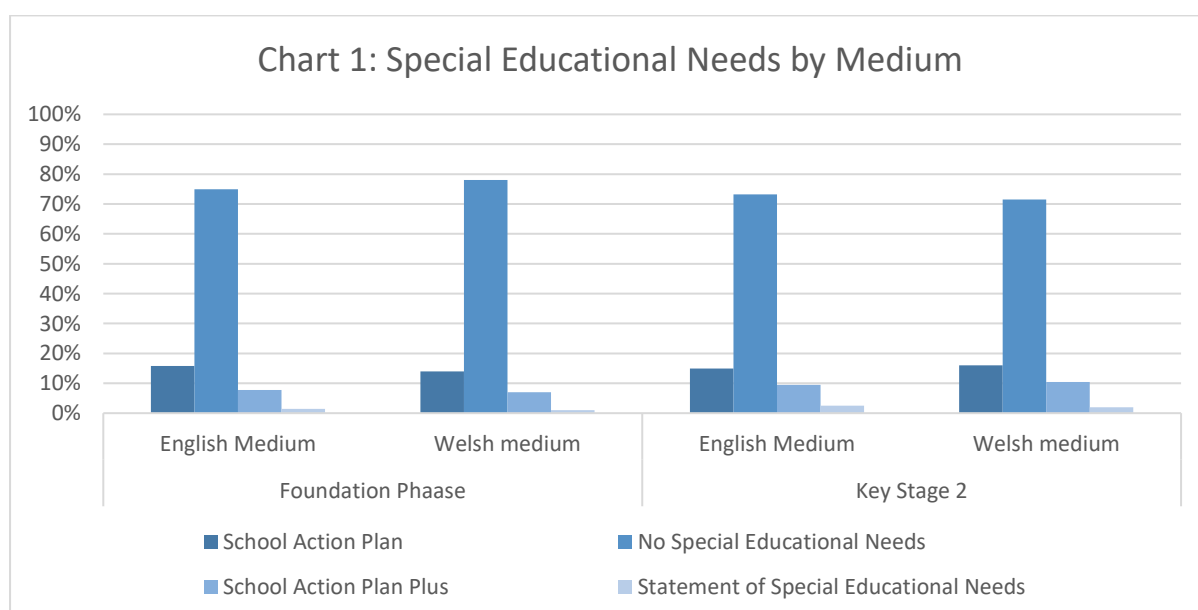
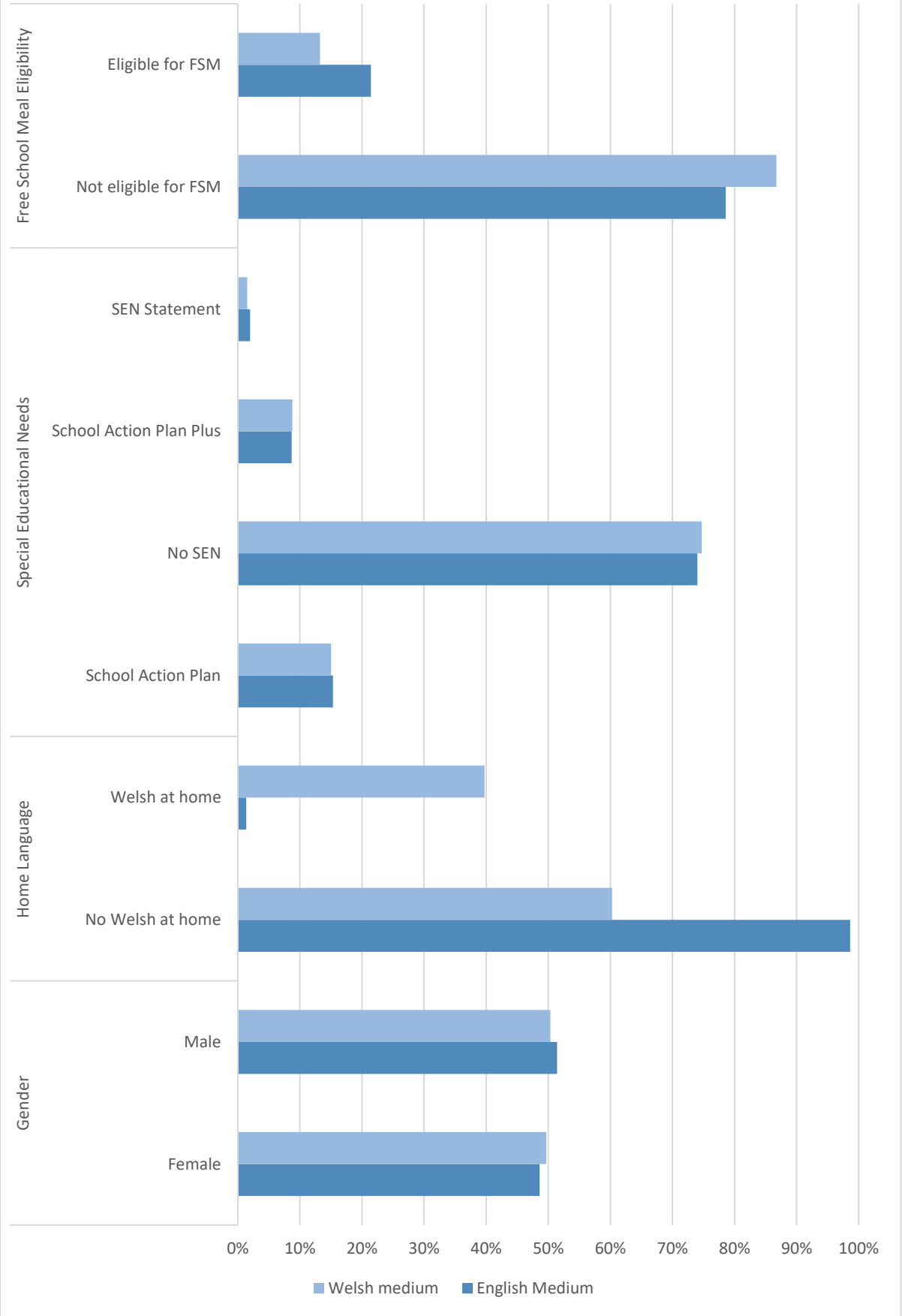


Chart 2: Primary Student Characteristics by Medium



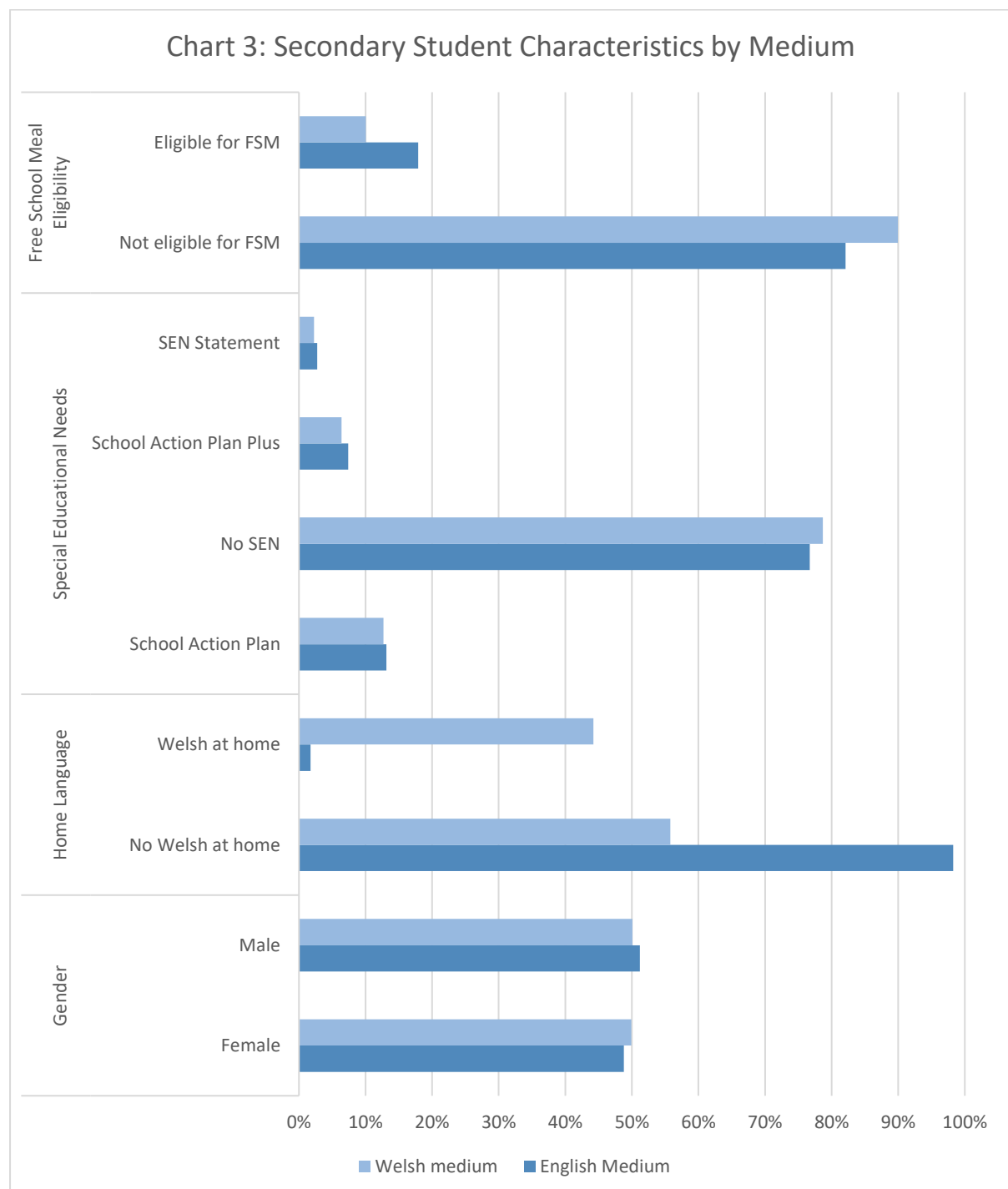
2.3 Secondary level, all groups

Overall, 19.8% of pupils were in Welsh medium education.

Of those in Welsh medium education, 44.2% spoke Welsh at home, while 1.7% of those in English medium education.

The proportion of students eligible for free school meals in English medium schools is 17.9%, while in Welsh medium schools it is 10.0%.

There was a slightly lower proportion of students in Welsh medium schools with special educational needs (21.3% compared to 23.3%).

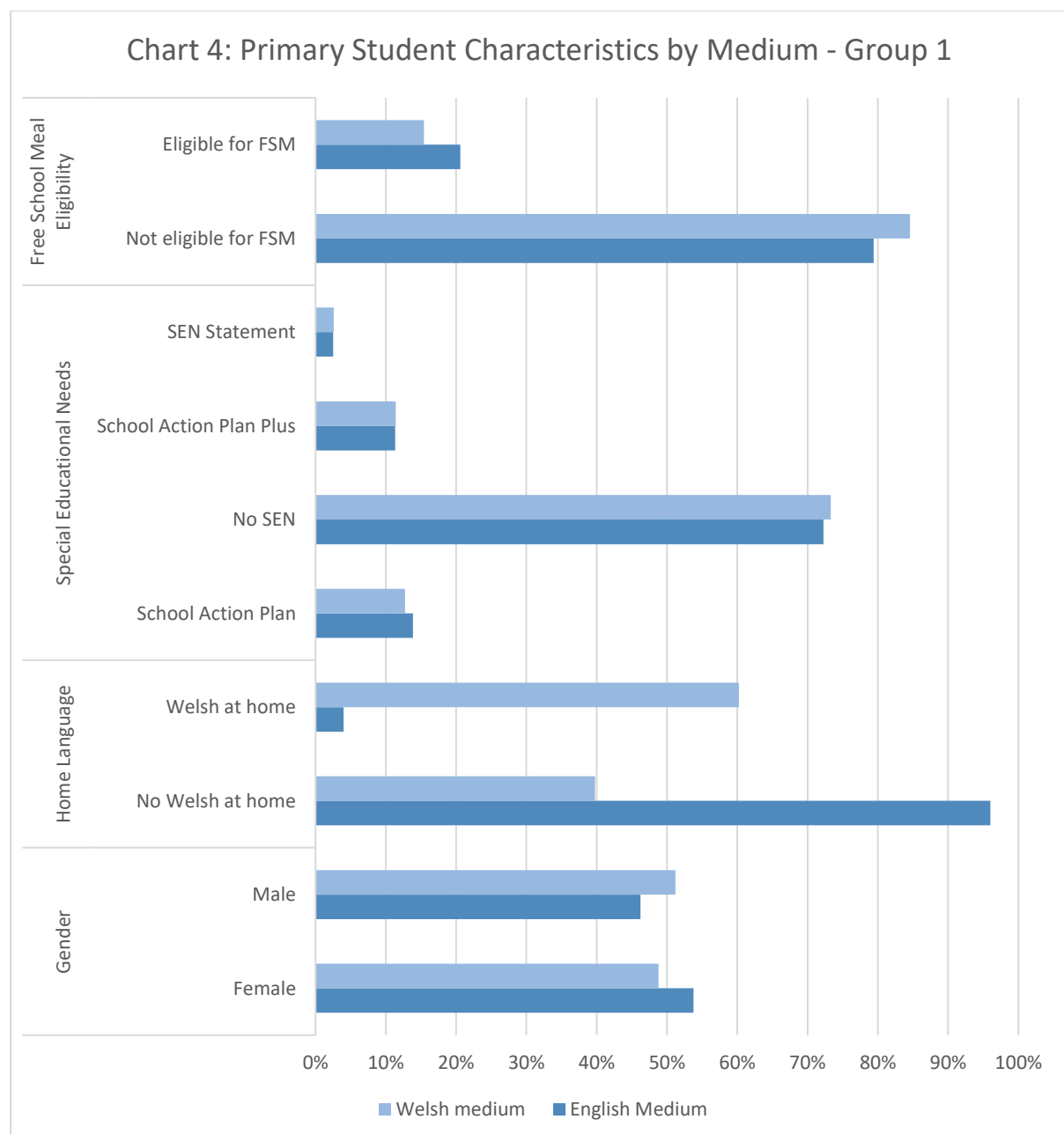


2.4 Primary level, Group 1

There were few English medium students in this group (1.9% were in English medium) so results should be taken with caution. As one would expect, higher proportions of students spoke Welsh at home than average in both mediums, 4.0% in English medium, and 60.2% in Welsh medium. Primary schools in this group have a higher proportion of students who speak Welsh at home than primary schools in any other group.

The proportions of students who had special educational needs were fairly similar for English and Welsh medium schools, but a higher proportion of students in English medium schools were eligible for free school meals (20.6% compared to 15.4%).

Unlike primary schools as a whole, the proportion of female pupils is higher in the English medium schools than in Welsh medium (53.8% compared to 48.8%).



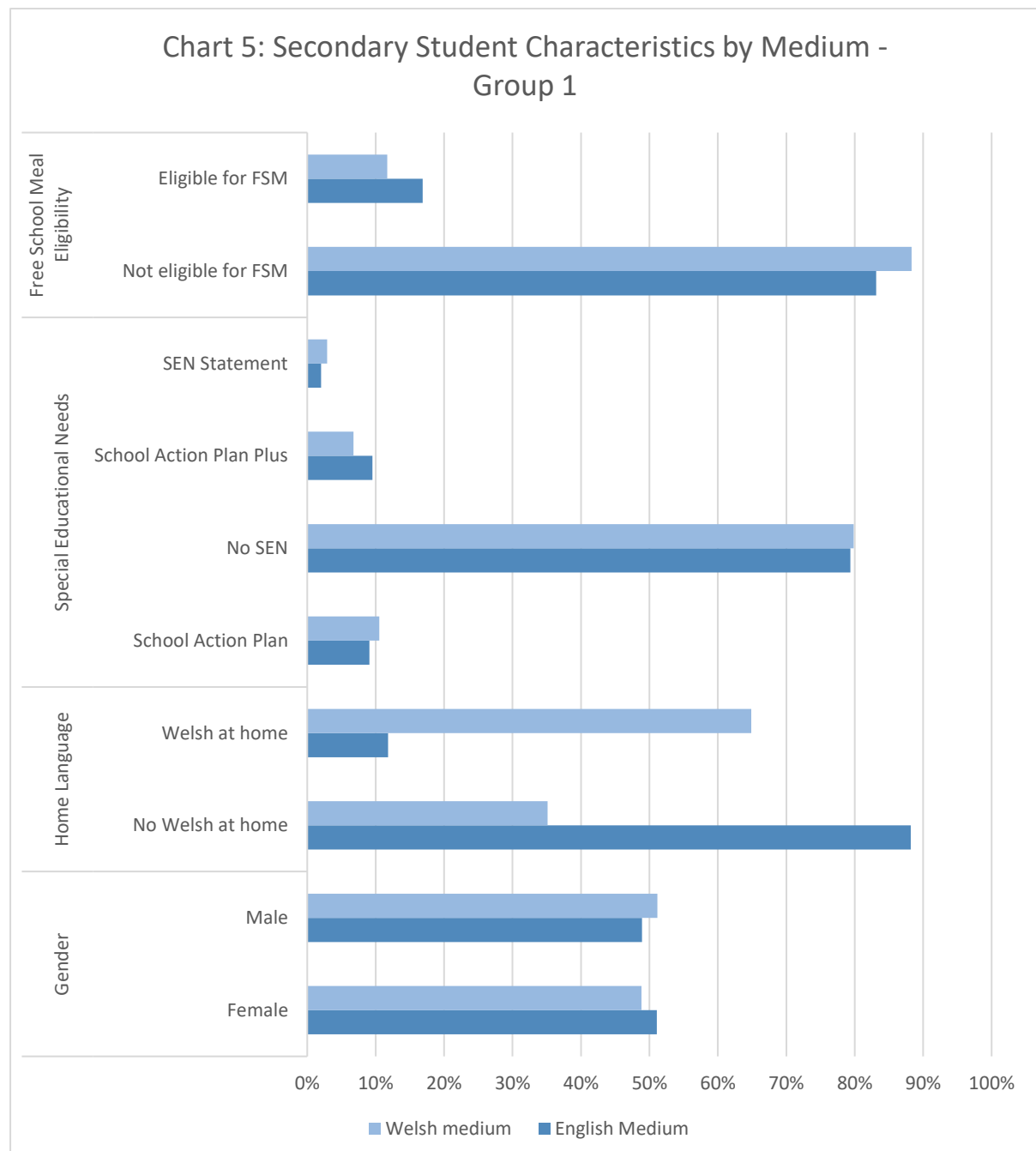
2.5 Secondary level, Group 1

As at the primary level, there is a higher proportion of female pupils in English medium education, at 51.1% compared to 48.9%.

There is also a higher proportion of pupils who are eligible for free school meals in English medium education, but the difference is less stark than for secondary schools as a whole, at 16.7% compared to 11.7%.

The proportions of pupils who had special educational needs were very similar in both mediums.

Of pupils in Welsh medium education, 64.9% spoke Welsh at home, compared to 11.8% of those in English medium education.

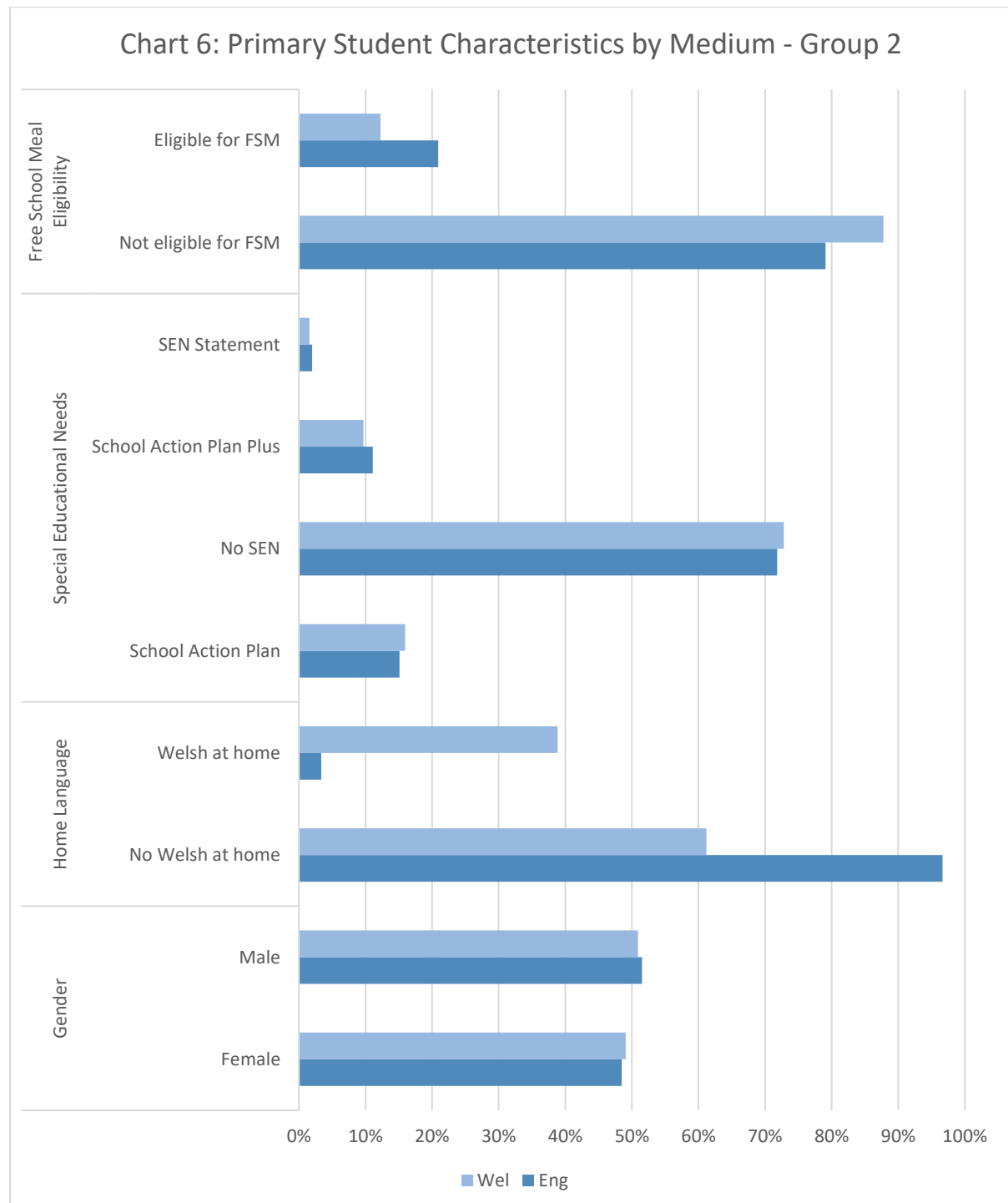


2.6 Primary, Group 2

Once again, the biggest disparity was in the proportion of those who speak Welsh at home. Only 3.3% of pupils in English medium education spoke Welsh, while 38.8% of those in Welsh medium education did so.

The difference in the proportion with special educational needs was small, as was the gender difference.

The proportion eligible for free school meals was 20.9% in English medium schools, and 12.2% in Welsh medium.

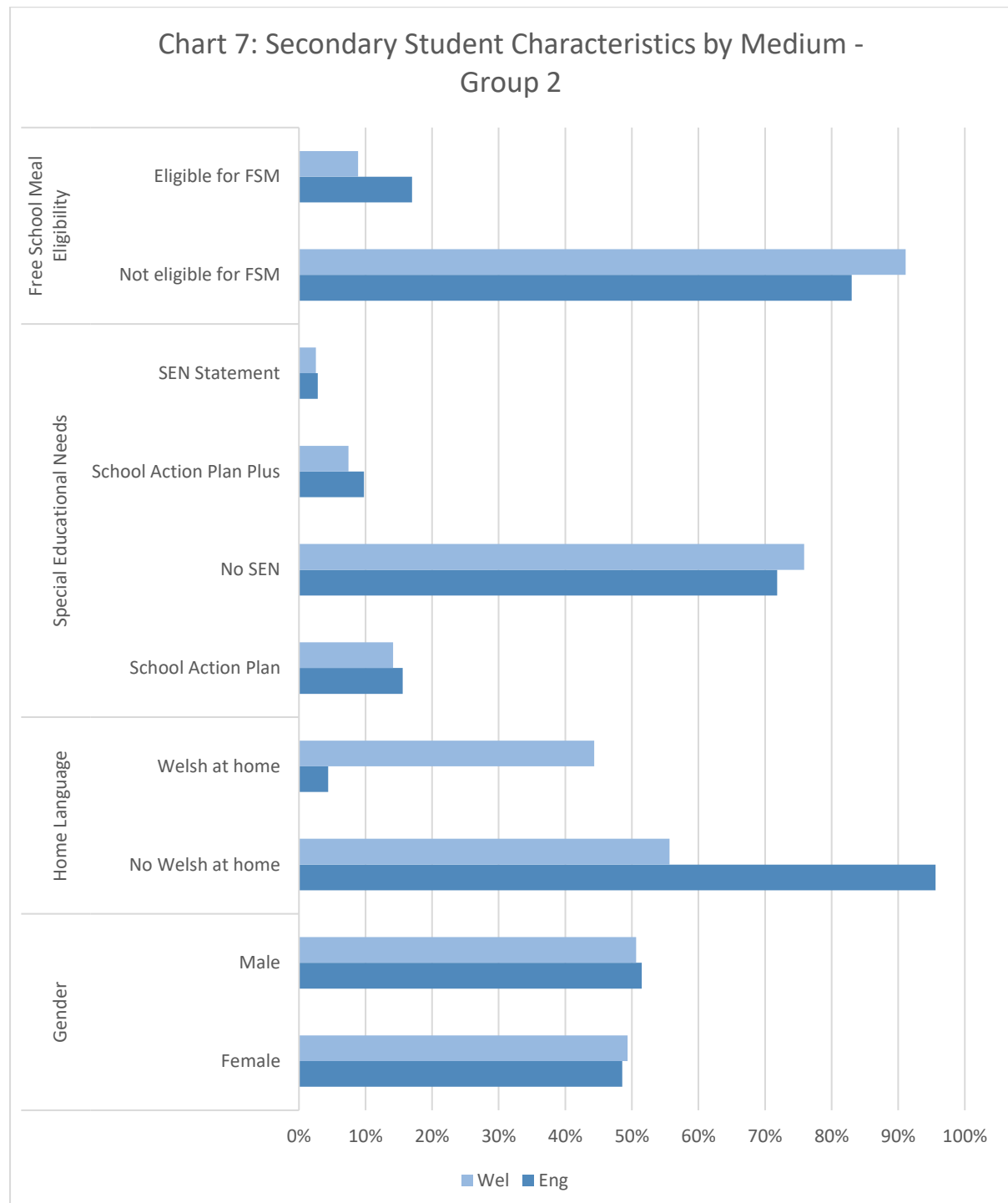


2.7 Secondary, Group 2

There are marked differences in the proportions eligible for free school meals (8.9% in Welsh medium education and 17.0% in English medium) and in the proportion with special educational needs (24.1% in Welsh medium and 28.2% in English).

The largest difference was still in the proportions of those who speak Welsh at home, with 4.4% of those in English medium speaking Welsh at home, and 44.3% of those in Welsh medium.

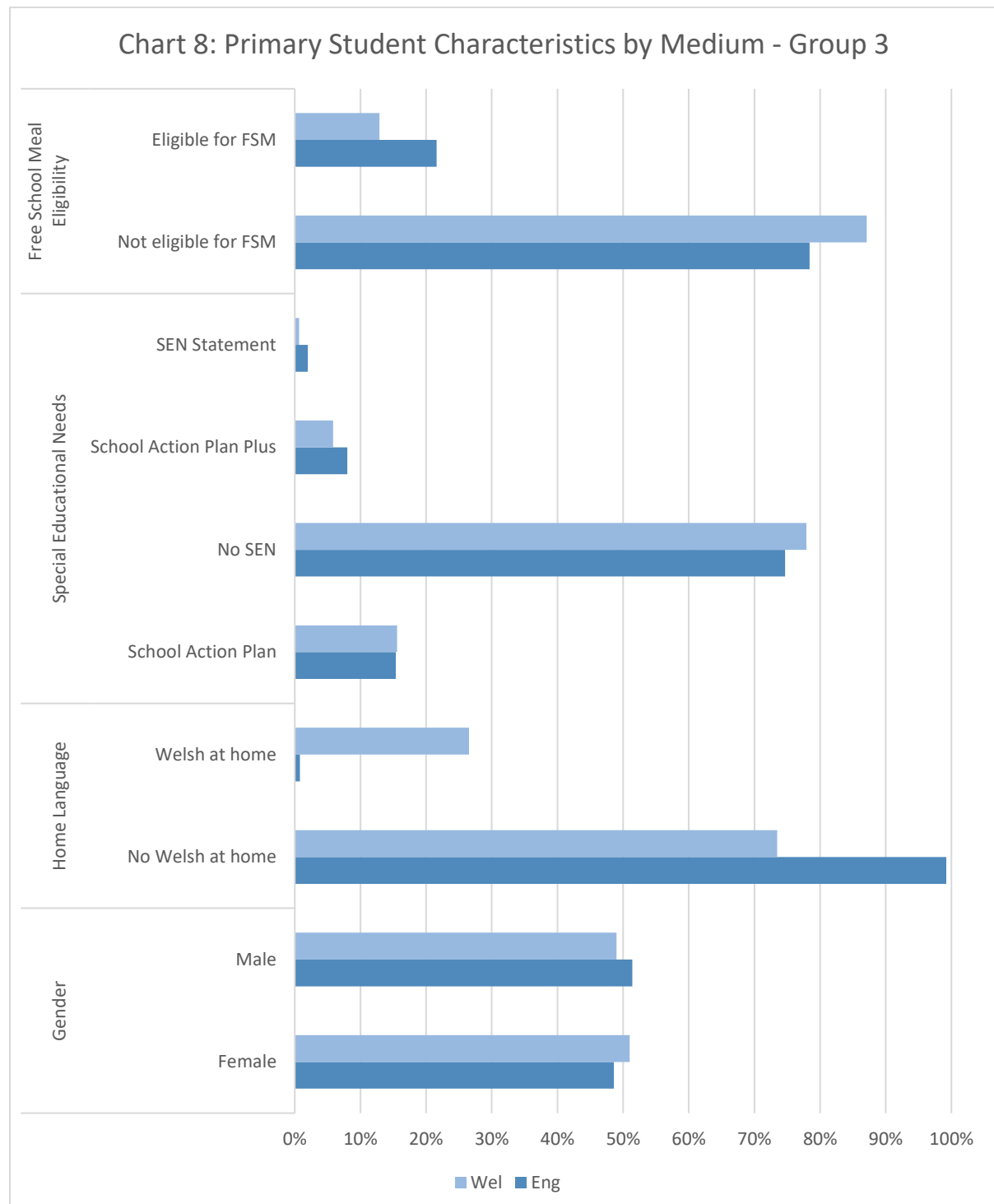
The proportions of males and females were broadly similar in both mediums.



2.8 Primary, Group 3

Welsh medium education has higher proportions of students who are female (51.0% compared to 48.6% in English medium), and who speak Welsh at home (26.5% compared to 0.8% in English medium).

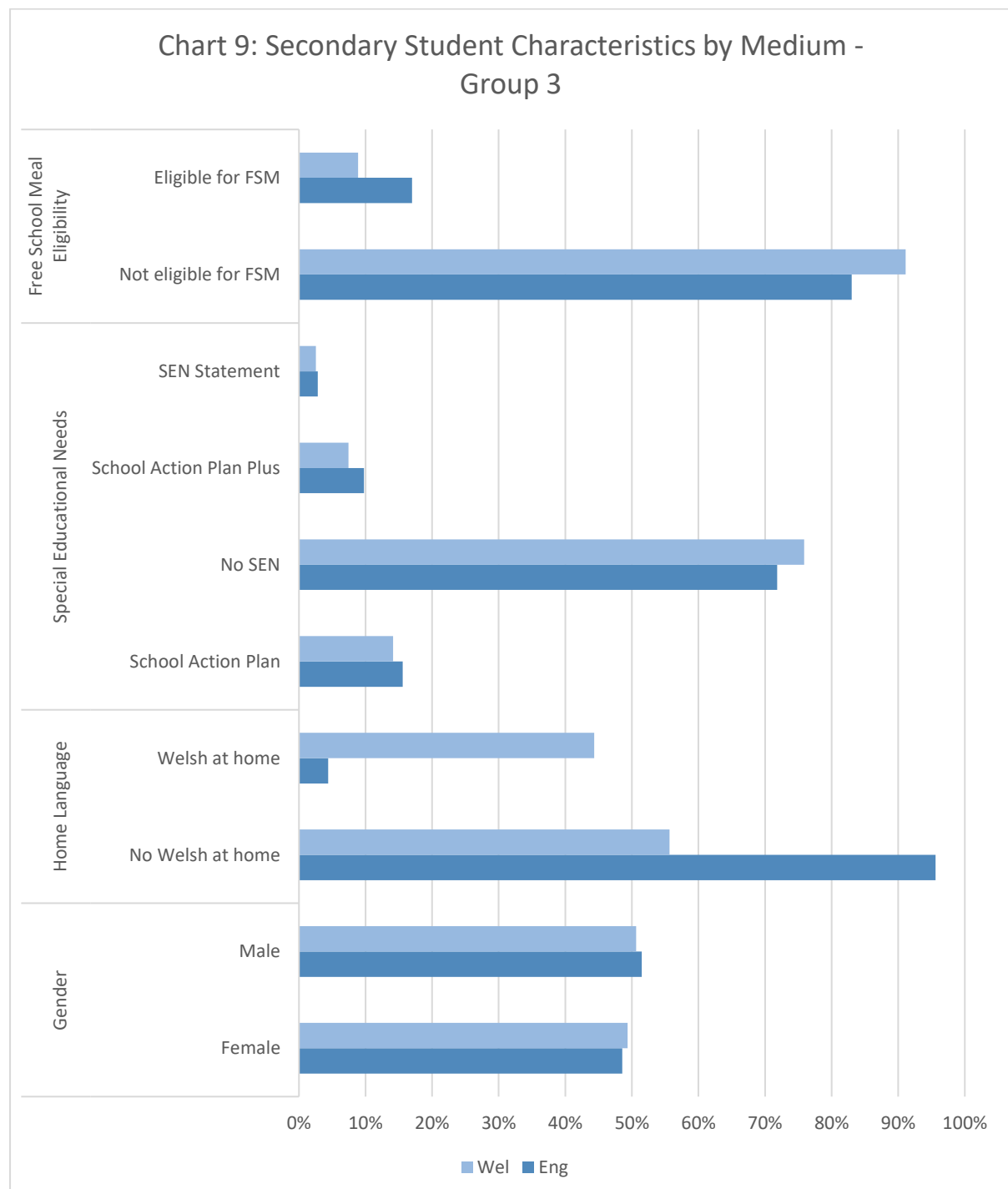
There are higher proportions of students with special educational needs in English medium education (25.3% compared to 22.1% in Welsh medium), and also of students eligible for free school meals (21.6% compared to 12.9% in Welsh medium).



2.9 Secondary, Group 3

As at the primary level, secondary pupils in this group are more likely to be female if in Welsh medium (51.7% female in Welsh medium, 48.8% female in English medium). They are also more likely to speak Welsh at home, with 26.1% of pupils in Welsh medium education speaking Welsh at home, and 0.7% of pupils in English medium education.

Pupils in English medium education were more likely to be eligible for free school meals (18.2% compared to 10.3%) and to have special education needs (21.7% compared to 18.2%).



3.1 Analysis of differences in achievement by medium

As can be seen from the analysis of characteristics, it is not sufficient to simply compare raw scores from English and Welsh medium schools, owing to the difference between the intakes of these schools.

A analysis technique called logistic binary regression is used, first to decide which characteristics have a significant impact on a student's probability of achieving CSI, then to calculate the probabilities of a student with given characteristics achieving the CSI, or core subject indicator, which shows that the student has met the expected level for their age. For Key Stage 4, the indicator used is whether the student has achieved at least 5 level 2 qualifications, including English, Welsh and maths.

To interpret the results, as well as examining probabilities for each student type, a technique called Average Marginal Effects is used. This shows the effect of making a change in one variable over the population.

As an extension of this technique, analysis was also carried out looking at some hypothetical scenarios. Four scenarios were considered:

Scenario 1: All pupils were in Welsh medium education.

Scenario 2: All pupils were in English medium education.

Scenario 3: All pupils who speak Welsh at home were in Welsh medium education; all pupils who do not were in English medium education.

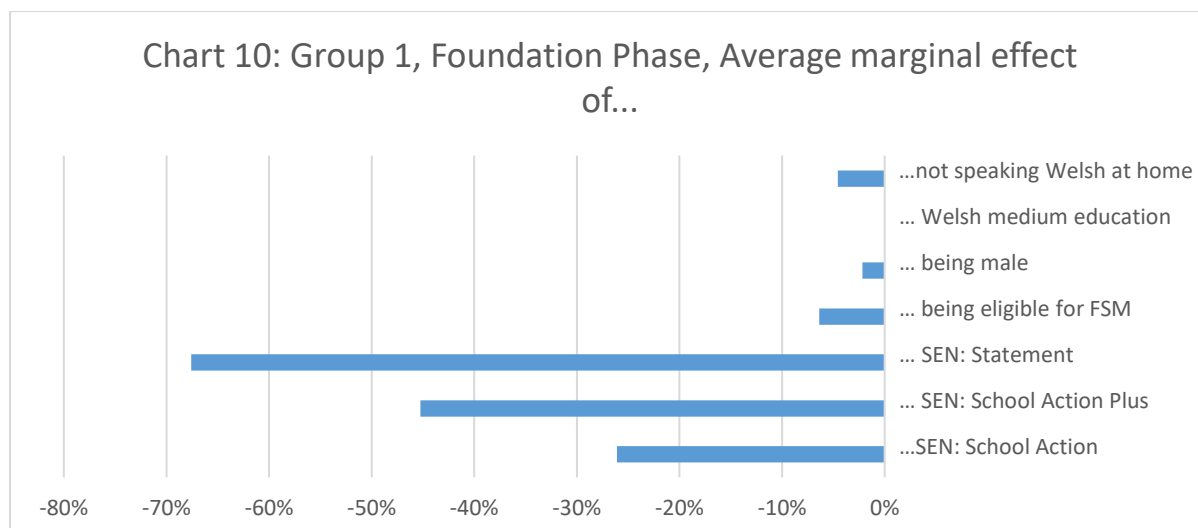
Scenario 4: All pupils who speak Welsh at home were in English medium education; all pupils who do not were in Welsh medium education.

These scenarios are not intended to reflect likely policy outcomes; they are intended to give an impression of what effect educational medium has. Results for these scenarios are discussed at the all Wales level only.

It should be noted that the data used is historic. That is, when, for instance, Scenario 1 is discussed, we are not calculating the future probability of a pupil achieving CSI if all education was to be Welsh medium. We are calculating the probability of a pupil having achieved CSI in the past, had all pupils been educated through the medium of Welsh, from 2011 to 2018. It is possible that past and future pupils might have different characteristics, or that changes in the curriculum or in wider society would change the future probability of a pupil achieving CSI in either medium.

3.2 Regression and Average Marginal Effects Analysis, Group 1, Foundation Phase

For Group 1, the regression analysis for the Foundation Phase found that medium was not a significant variable, nor were any of the interactions between medium and other variables. This means that the analysis suggests that in this group, the medium of education has no impact on the probability of achieving CSI. The marginal effects of the education medium were therefore 0.



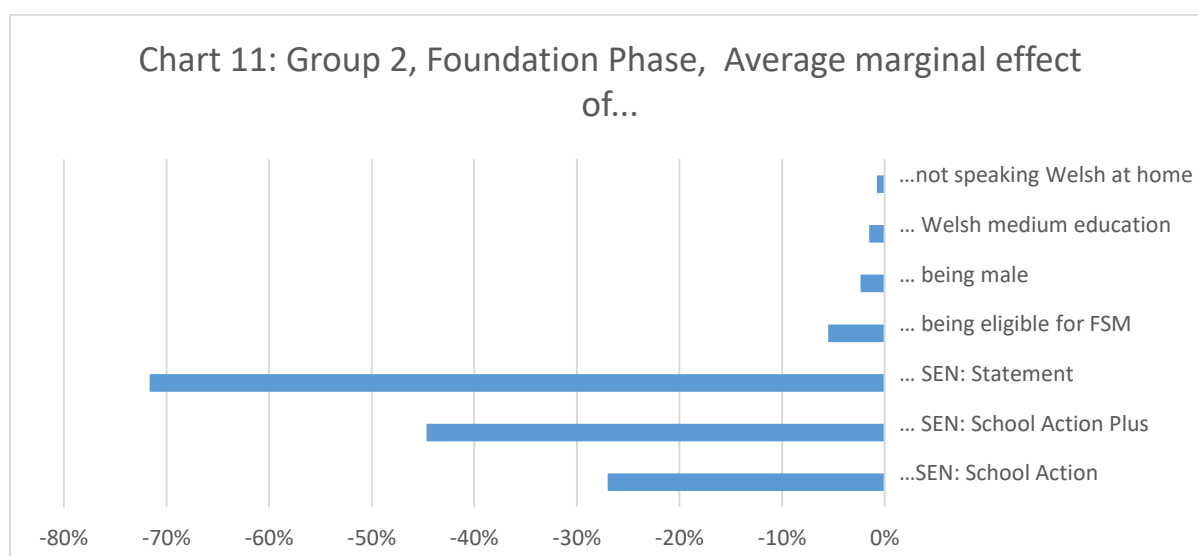
3.3 Regression and Average Marginal Effects Analysis, Group 2, Foundation Phase

In Group 2, regression analysis found that the medium was a significant factor in a pupil's likelihood of achieving the CSI.

This effect is quite small; the marginal effect of Welsh medium education as compared to English medium is -1.5 percentage points. In contrast, the marginal effect of having stated special educational needs is -71.6 percentage points, and the marginal effect of being eligible for free school meals is -5.5 percentage points.

So although the medium of education has an impact upon achievement, it is much smaller than other relevant variables.

When the probability of a student with certain characteristics of achieving CSI is considered, for students without special educational needs, in general, the probability of achieving CSI is higher in Welsh medium education for those who speak Welsh at home, while the probability of achieving CSI is higher in English medium education for those who do not. For students who do have special educational needs, no clear picture emerges.

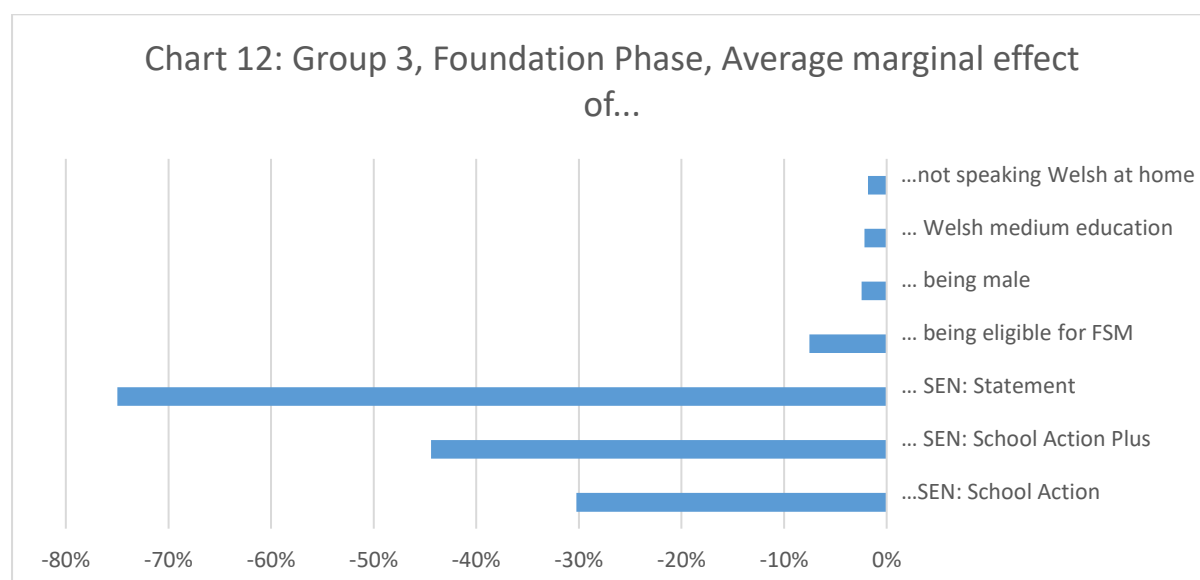


3.4 Regression and Average Marginal Effects Analysis, Group 3, Foundation Phase

Educational medium had a statistically significant effect on a pupil's chance of achieving CSI for this stage and group. Average marginal effects analysis showed that, for pupils in this group, there was a small negative marginal effect for Welsh medium education of -2.2 percentage points.

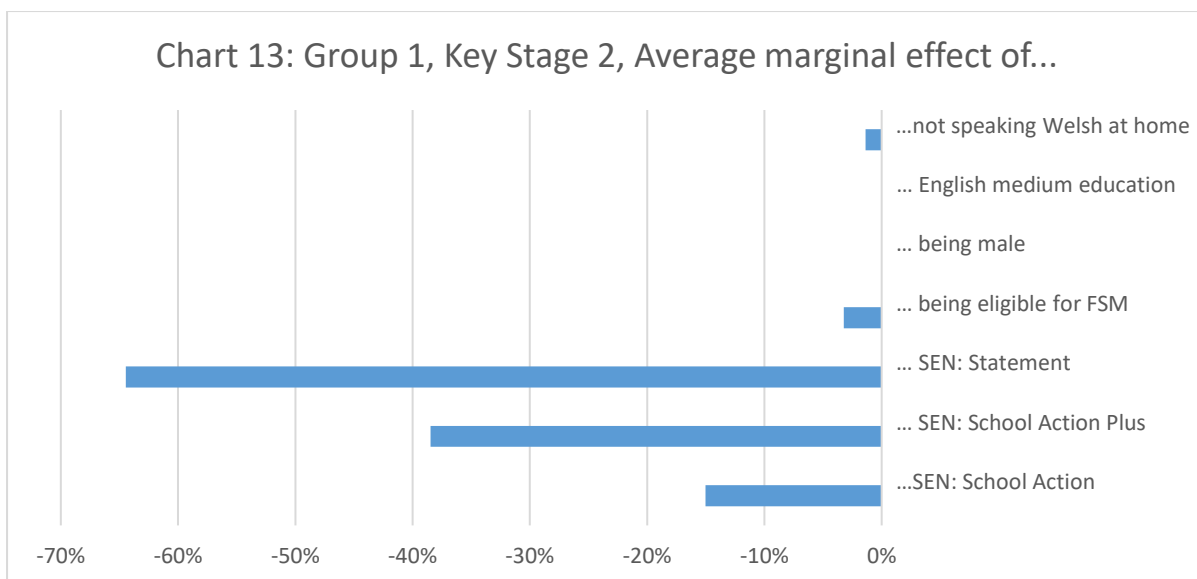
As with group 2, the marginal effect of educational medium is considerably less than that of other variables, e.g. special educational needs, with a marginal effect of up to -75.0 percentage points, or free school meal entitlement, with a marginal effect of -7.5 percentage points.

When the probability of a given individual achieving CSI was considered, pupils who were eligible for FSM were more likely to achieve CSI in English medium education, as were pupils who did not speak Welsh at home. Pupils not eligible for FSM who spoke Welsh at home were however more likely to achieve CSI in Welsh medium education.



3.5 Regression and Average Marginal Effects Analysis, Group 1, Key Stage 2

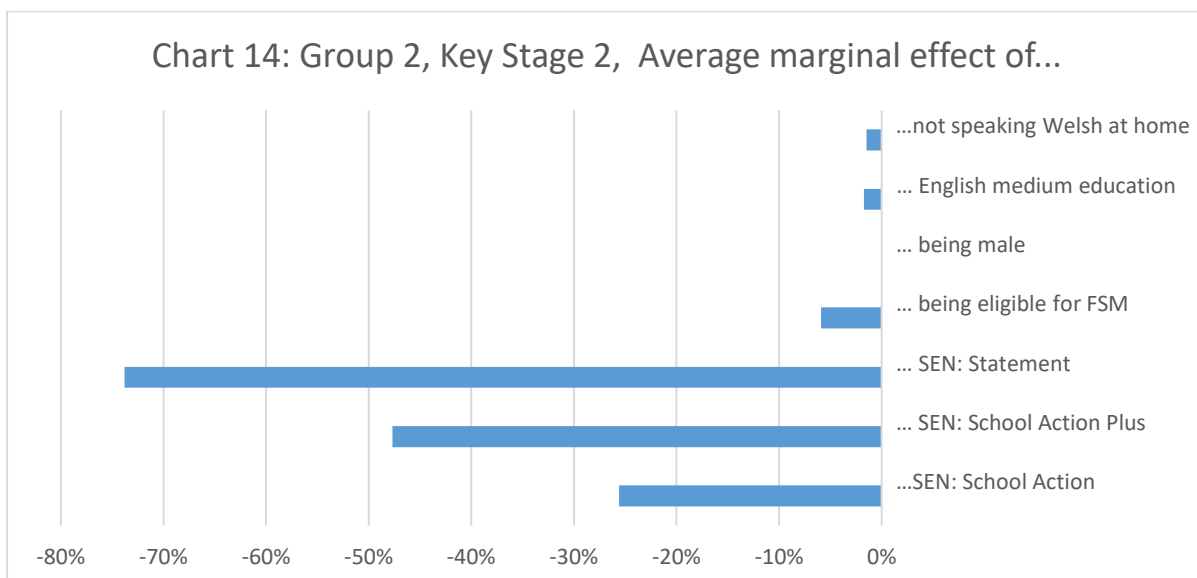
As in the Foundation Phase, the regression analysis for Key Stage 2 found that medium was not a significant variable for Group 1, nor were any of the interactions between medium and other variables significant. This means that the analysis suggests that in this group, the medium of education has no impact on the probability of achieving the CSI. The marginal effects of the education medium were therefore 0.



3.6 Regression and Average Marginal Effects Analysis, Group 2, Key Stage 2

The educational medium was statistically significant for this group, with a small positive marginal effect of +1.7% for Welsh medium education compared to English medium. Again, this is smaller than other marginal effects; those due to special educational needs, and free school meal eligibility.

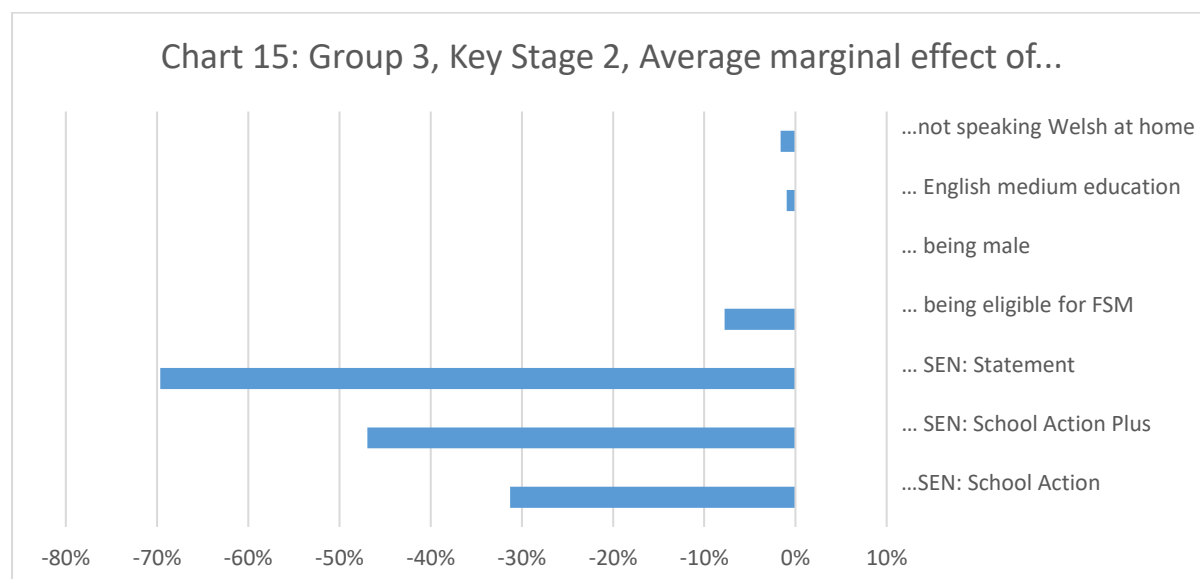
When looking at the probability of pupils with certain characteristics achieving CSI, most types of pupils are more likely to achieve CSI in Welsh medium education. The exception is those with statemented special educational needs.



3.7 Regression and Average Marginal Effects Analysis, Group 3, Key Stage 2

This group also had a statistically significant effect from medium. The marginal effect of this was a modest +1.0 percentage points for Welsh medium education as compared to English; once more this is dwarfed by marginal effects of special educational needs and free school meal eligibility.

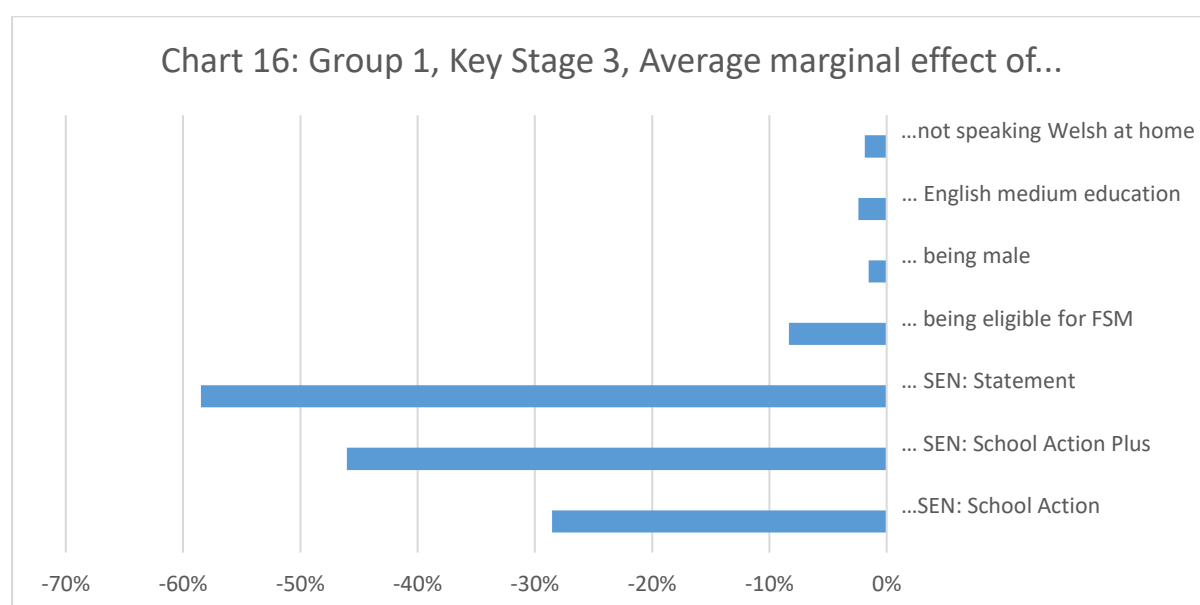
Considering the probability of an individual student achieving CSI, there is no clear overall pattern. Most types of pupils were more likely to achieve CSI in Welsh medium education.



3.8 Regression and Average Marginal Effects Analysis, Group 1, Key Stage 3

For the first time in Group 1, for Key Stage 3 the regression analysis identified medium as a statistically significant variable. The marginal effect of this is +2.4 percentage points for Welsh medium education as compared to English medium. This is still smaller than the marginal effects seen for special educational needs or free school meal eligibility, although larger than the marginal effects of speaking Welsh at home or gender.

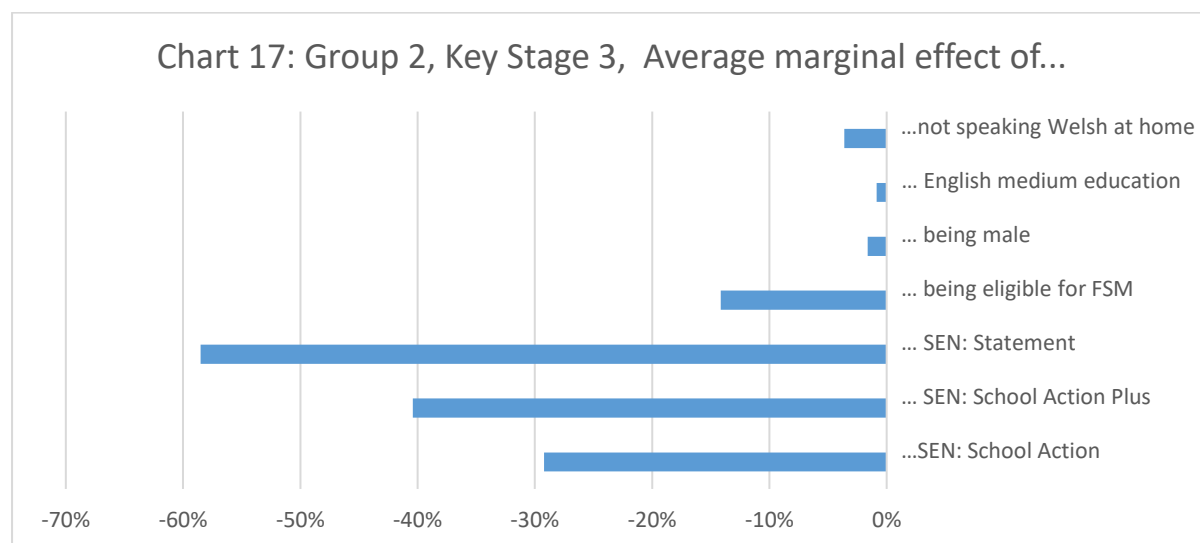
Again, when the probability of a student achieving CSI in each medium is considered, the characteristics of students who are more likely to achieve CSI in Welsh medium education are not clear.



3.9 Regression and Average Marginal Effects Analysis, Group 2, Key Stage 3

The effect of medium in Group 3 is statistically significant; the marginal effect is +0.8 percentage points for Welsh medium education. As in other stages and groups, this is smaller than the effects of special educational needs or free school meal eligibility. It was also smaller than the effect of speaking Welsh at home or gender. [Chart](#)

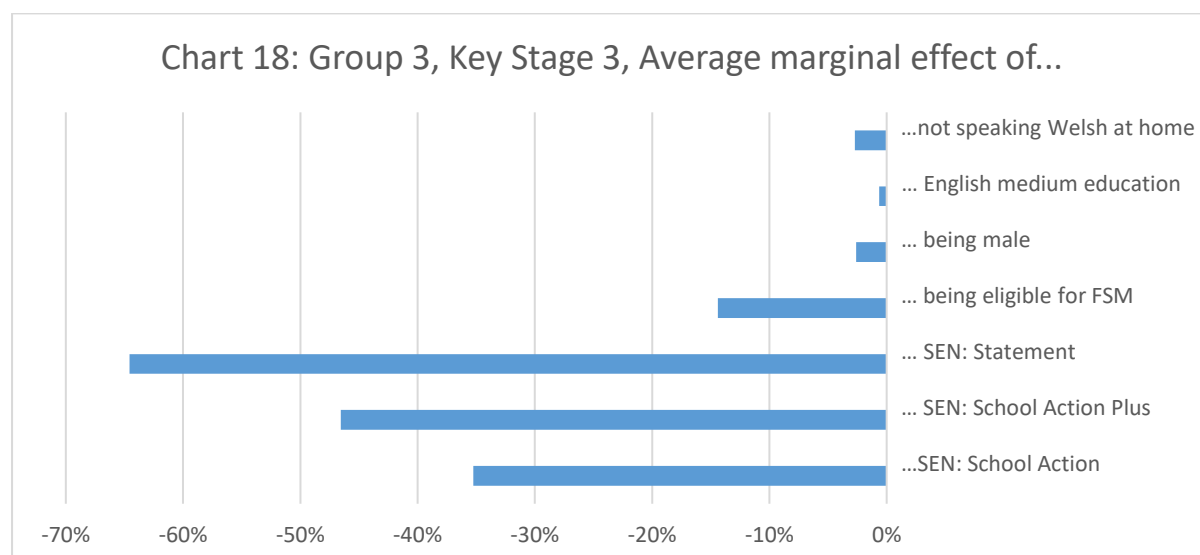
When looking at the probability of pupils with certain characteristics achieving CSI, most types of pupils are more likely to achieve CSI in Welsh medium education. The exception is those with statemented special educational needs, or on School Action Plan Plus.



3.10 Regression and Average Marginal Effects Analysis, Group 3, Key Stage 3

The educational medium has a statistically significant effect on a student's chance of achieving the CSI. The average marginal effect is very modest; 0.6 percentage points, less than the marginal effect for any other variable. [Chart](#)

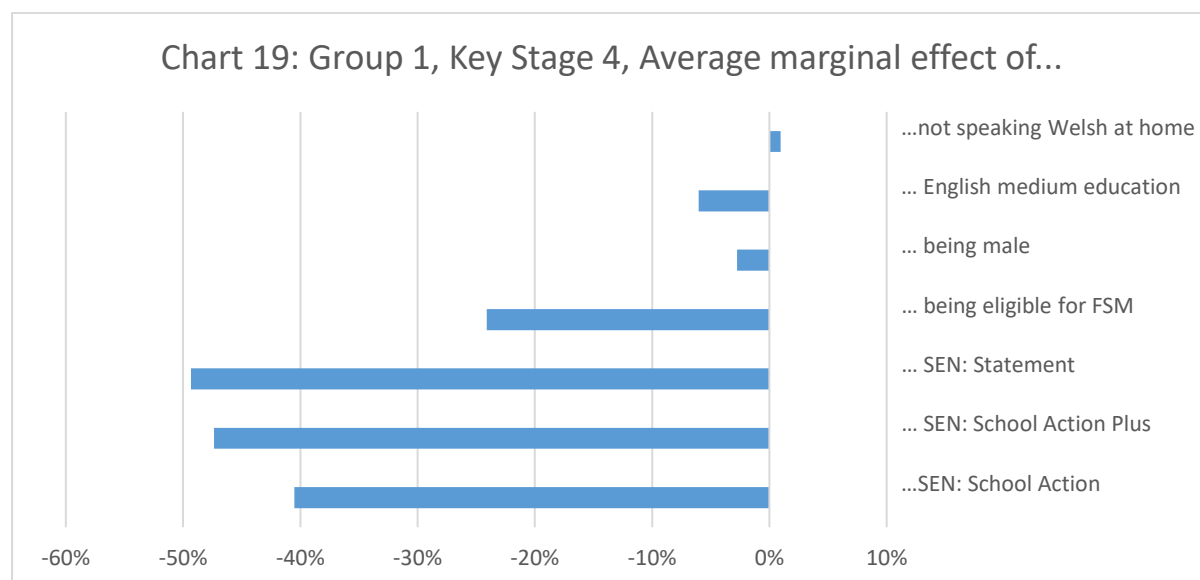
There are no students who the model predicts would be more likely to achieve CSI in English medium education.



3.11 Regression and Average Marginal Effects Analysis, Group 1, Key Stage 4

The analysis suggests that the educational medium does have a significant effect on the probability of a student achieving the expected level. The marginal effect is larger than for most groups and stages, with an effect of +6.0 percentage point from Welsh medium education. This is still however smaller than the effect of special educational needs or free school meal eligibility.

There are no students who the model suggests would be more likely to achieve the expected level in English medium education.

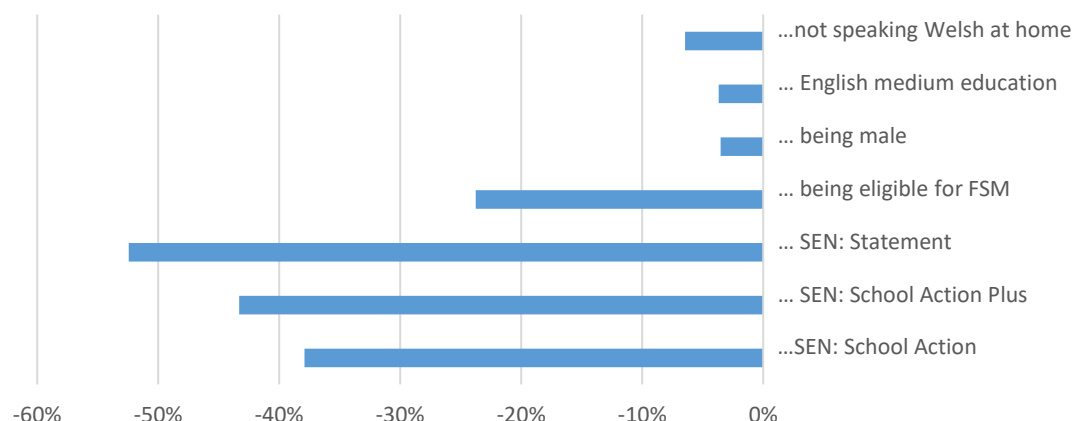


3.12 Regression and Average Marginal Effects Analysis, Group 2, Key Stage 4

Educational medium had a statistically significant effect, with an average marginal effect of +3.7 percentage points for Welsh medium education compared with English medium. This was larger than the marginal effect of gender, but smaller than the effects of free school meal eligibility, special educational needs or speaking Welsh at home.

Those who do not have special educational needs are more likely to achieve CSI in Welsh medium education, but those who have School Action Plus plans are more likely to achieve CSI in English medium education. The situation for those who have other types of special educational needs is less clear.

Chart 20: Group 2, Key Stage 4, Average marginal effect of...

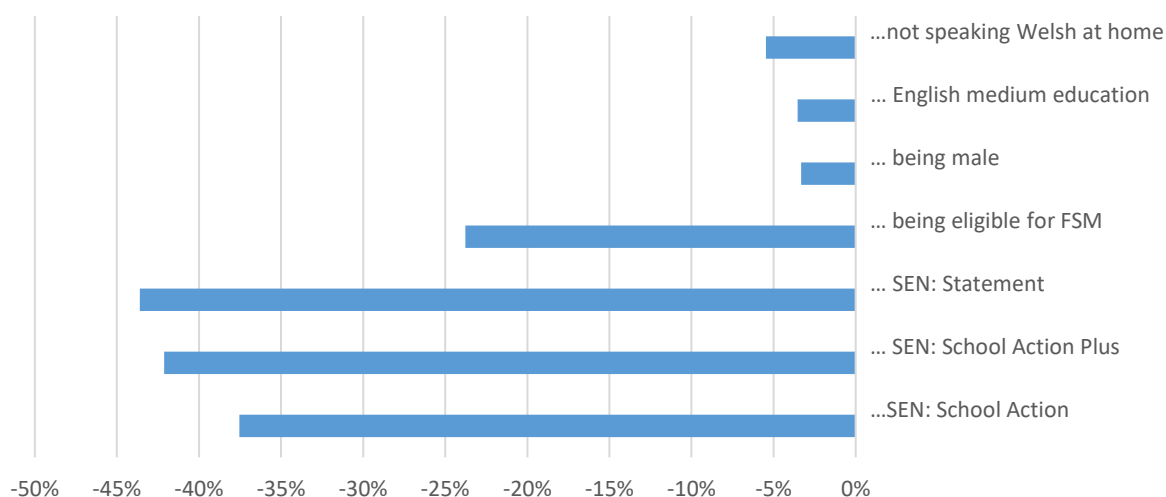


3.13 Regression and Average Marginal Effects Analysis, Group 3, Key Stage 4

Educational medium is identified in the analysis as a statistically significant factor. The average marginal effect of Welsh medium education compared to English medium is +3.5 percentage points. This means that educational medium has a smaller effect than free school meal eligibility, special educational needs or speaking Welsh at home, but a larger effect than gender.

It is not clear which pupils characteristics would make them more likely to achieve the expected level in English medium education, but the vast majority of pupil types are more likely to achieve CSI in Welsh medium.

Chart 21: Group 3, Key Stage 4, Average marginal effect of...



4.1 Scenario Analysis

In each case, the observed proportions of students achieving the CSI or expected level in the data are noted, as well as modelled proportions for each scenario.

Scenario 1: All pupils were in Welsh medium education.

Scenario 2: All pupils were in English medium education.

Scenario 3: All pupils who speak Welsh at home were in Welsh medium education; all pupils who do not were in English medium education.

Scenario 4: All pupils who speak Welsh at home were in English medium education; all pupils who do not were in Welsh medium education.

It should be noted that in each case, the differences between scenarios are small. Some of the results may seem counter-intuitive; these are generally explained when one remembers that the proportion of students who do not speak Welsh at home is far higher than the proportion who do.

It should be noted that these are hypothetical scenarios to illustrate extremes, and are not only highly unlikely but that if they were to occur, that very fact would substantially change the data behind the model and hence the model itself.

4.2 Foundation Phase

The observed proportion of students in the data analysed who achieved CSI was 85.9%.

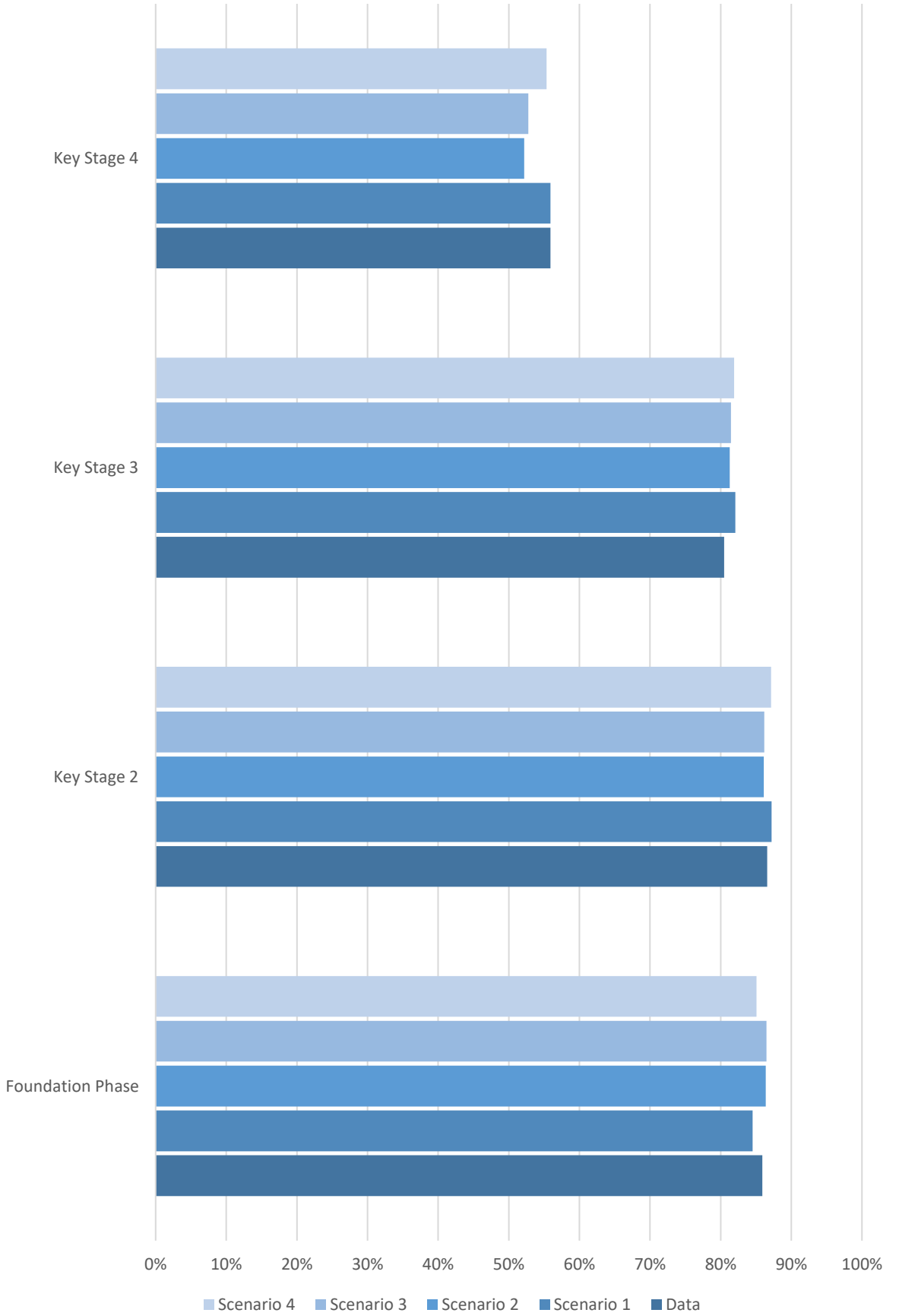
Under the scenario where all students are in Welsh medium education, the model suggests that 84.5% of students would achieve CSI in the Foundation Phase.

Under the scenario where all students are in English medium education, the model suggests that 86.4% of students would achieve CSI in the Foundation Phase.

Under the scenario where all students who speak Welsh at home are in Welsh medium education, but all students who do not are in English medium education, the model suggests that 86.5% of students would achieve CSI in the Foundation Phase.

Under the scenario where all students who speak Welsh at home are in Welsh medium education, but all students who do not are in English medium education, the model suggests that 85.0% of students would achieve CSI in the Foundation Phase.

Chart 22: Scenario Analysis



4.3 Key Stage 2

The percentage of students observed in the data who achieved CSI at the end of KS2 is 86.6%.

Under the scenario where all students are in Welsh medium education, the model suggests that 87.2% of students would achieve CSI in KS2.

Under the scenario where all students are in English medium education, the model suggests that 86.1% of students would achieve CSI in KS2.

Under the scenario where all students who speak Welsh at home are in Welsh medium education, but all students who do not are in English medium education, the model suggests that 86.2% of students would achieve CSI in KS2.

Under the scenario where all students who speak Welsh at home are in Welsh medium education, but all students who do not are in English medium education, the model suggests that 87.1% of students would achieve CSI in KS2.

4.4 Key Stage 3

The percentage of students observed in the data who achieved CSI at the end of KS3 is 80.5%.

Under the scenario where all students are in Welsh medium education, the model suggests that 82.1% of students would achieve CSI in KS3.

Under the scenario where all students are in English medium education, the model suggests that 81.3% of students would achieve CSI in KS3.

Under the scenario where all students who speak Welsh at home are in Welsh medium education, but all students who do not are in English medium education, the model suggests that 81.5% of students would achieve CSI in KS3.

Under the scenario where all students who speak Welsh at home are in Welsh medium education, but all students who do not are in English medium education, the model suggests that 81.9% of students would achieve CSI in KS3.

4.5 Key Stage 4

The percentage of students observed in the data who achieved the expected level at the end of KS4 is 55.9%.

Under the scenario where all students are in Welsh medium education, the model suggests that 55.9% of students would achieve the expected level in KS4.

Under the scenario where all students are in English medium education, the model suggests that 52.2% of students would achieve the expected level in KS4.

Under the scenario where all students who speak Welsh at home are in Welsh medium education, but all students who do not are in English medium education, the model suggests that 52.8% of students would achieve the expected level in KS4.

Under the scenario where all students who speak Welsh at home are in Welsh medium education, but all students who do not are in English medium education, the model suggests that 55.3% of students would achieve the expected level in KS4.