NHS
Greater Glasgow and Clyde

Public Health Screening Programme

Annual Report

1 April 2017 to 31 March 2018

Health Services
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Contact details: Dr Emilia Crighton, Health Services, Public Health Directorate, NHS Greater Glasgow and Clyde.
Email: PHSU.Admin@ggc.scot.nhs.uk
Website: www.nhsggc.org.uk/phsu
Tel: 0141 201 4933

Introduction

This annual report presents information about the following screening programmes for the period 2017/18:

1. Pregnancy Screening:
    - Antenatal Haemoglobinopathies Screening
    - Infectious Diseases in Pregnancy
    - Down's syndrome Screening and other congenital anomalies

2. Newborn Screening:
    - Newborn Bloodspot Screening
    - Universal Newborn Hearing Screening

3. Child Vision Screening
    - Pre-school Vision Screening
    - P7 Vision Screening

4. Aortic Abdominal Aneurysm Screening

5. Bowel Screening

6. Breast Screening

7. Cervical Screening

8. Diabetic Retinopathy Screening

The report includes analysis of uptake among people with learning disabilities, mental illness and uptake by ethnicity.

The purpose of screening is to detect early disease or risk factors among people who have not yet developed symptoms. Early management should result in better outcomes. Screening programmes do not detect all cases of disease and will be positive among some people who do not have the disease. They therefore contribute to early detection but do not obviate the need for investigating symptomatic patients.

Programme performance overview 2017-2018

Screening programme	Total eligible population	Total number Screened	HIS Target	% Uptake
Cervical (Screened within 5.5 yrs)	329,796	236,993	80%	71.9%
Breast (Eligible in March 2018)	160,904	Not available	70%	Not available
Bowel (Screened within 2 yrs)	363,302	190,045	60%	52.3%
Pregnancy: Infectious diseases in pregnancy	12,396	14,986 Samples tested	95%	99%
Down's syndrome	12,396	10,244	No Target	82.6%
Haemoglobinopathies	12,396	12,072	95%	90.67%
Newborn: Newborn bloodspot	11,907	11,803	95%	98.1%
Newborn hearing	11,874	11,678	97%	98.3%
Pre-school vision	12,642	10,977	No Target	86.8%
Primary 7 school vision	11,807	8,785	No Target	74.4%
Diabetic Retinopathy	58,747	45,626	80%	77.7%
Abdominal Aortic Aneurysm	5,913	4,739	70%	80.1%

Section 1

Pregnancy & Newborn Screening

Chapter 1 - Pregnancy Screening

Summary

Antenatal haemoglobinopathies screening for sickle cell and thalassaemia aims to identify couples who are at risk of having an affected child and thereby offer them information on which to base reproductive choices. **Communicable diseases in pregnancy screening** aims to identify infection and ensure a plan for treatment and management of affected individuals and their babies is put in place at the earliest opportunity. Screening allows undiagnosed infection to be identified and treatment to be given, which can reduce the risk of mother to child transmission, improve the long-term outcome and development of affected children, and ensure that women, their partners and families are offered appropriate referral, testing and treatment. **Down's syndrome and other congenital anomalies screening** aims to detect Down's syndrome and other congenital anomalies in the antenatal period. This provides women and their partners with informed choice regarding continuation of pregnancy. It also allows, where appropriate, management options (such as cardiac surgery or delivery in a specialist unit) to be offered in the antenatal period.

Pregnancy screening programmes are offered universally to all pregnant women during antenatal visits. During 2017/18, of 14,791 women booked to attend antenatal clinics in NHSGCC 12,396 (83.8%) were NHSGGC residents. 10,311 (83.2%) of first antenatal booking appointments were offered within 12 weeks gestational age.

The ethnic origin of pregnant women was White British 8677 (70%), Asian Pakistani 597 (4.8%), Asian Indian 259 (2.1%), Black African 170, (1.4%), Chinese 144 (1.2%) and 485 (3.9%) of any other ethnic group.

In November 2017 NHSGGC introduced a new maternity IT application BadgerNet. A number of data sources were used in producing this report; Pregnancy and Newborn Screening Application (PNBS); BadgerNet; TrakCare; laboratory reports. Paper based screening request for haemoglobinopathies were used for a period of time.

Gestational Diabetes Mellitus (GDM) and Obesity

Within NHSGGC, the assessment of pregnant women and risks associated with GDM are based on a BMI>= 35, previous macrosomic baby (weighing >4 kg at birth), family history of diabetes, previous gestational diabetes and mother's ethnic origin. 3,471 (28.2%) of bookers were recorded as having 'any risk' of GDM and were eligible to be offered an oral glucose tolerance test at 24-28 weeks gestation**.**

5,361 (43.2%) of pregnant women had a normal weight at the time of their first antenatal booking appointment. 3,381 (27.3%) pregnant women were overweight, 1765(14.2%) obese and1053 (8.5%) severely obese (35<=BMI >=45)

Haemoglobinopathies Screening

Of the 12,396 women booked for their first antenatal booking, 12,072 (97.3%) consented and had a blood sample taken for haemoglobinopathies screening (performed), 10 refused and 307 were not asked/ not known or recorded. The blood is checked for risk of thalassaemia for all women who consented.

The Family Origin Questionnaire (FOQ) is completed as part of routine early antenatal risk assessment. The FOQ provides the basis for testing for haemoglobin variants by identifying if the woman and the baby's biological father are at risk of being a carrier for sickle cell and other haemoglobin variants. Electronic completed FOQ data was available for 7,708 (62.1%) women. A paper based FOQ was in use following changes to the IT application - data could not been captured electronically.

A screening blood test for haemoglobinopathies is offered when either parent is in a high risk group or when more than 2% of booking bloods are screen positive. 1.65% of consented booking samples were positive in NHSGGC. Partner testing is recommended to couples where the woman is a carrier for HbS or thalassaemia.

Screening outcomes for antenatal haemoglobinopathies screening was available for 11,239 women (90.67%). Depending on the outcome of FOQ, or in the absence of the FOQ, booking samples are tested for haemoglobinopathies.

The sample testing for haemoglobinopathies identified 63 women as sickle cell carriers (HbAS), 5 women as HbD carriers (HbAD) and 13 women as HbE carriers (HbAE).

The outcomes for thalassaemia screening identified 32 women as Beta Thalassaemia carriers and 316 as possible Alpha Zero Thalassaemia carrier and/or iron deficiency.

Infectious diseases

Uptake was greater than 99% for all of the infectious diseases in pregnancy screening tests.

Screening identified 16 women infected with HIV (15 were previously known); 46 infected with Hepatitis B Virus (33 were previously known); and 5 women affected with syphilis.

Down's syndrome and other congenital anomalies screening

Of the 12,396 women booked at antenatal clinics, 10,244 (82.6%) were tested either for the 1st or 2nd Trimester. 164 high risk results were recorded for the 1st Trimester and 81 for the 2nd Trimester Down's syndrome screening**.**
227 amniocentesis samples were analysed and 59 abnormalities detected (26%) and of these 41 (18%) had a diagnosis of trisomy 21 (Down's syndrome).

113 chorionic villus biopsies were analysed and 45 abnormalities detected (30.7% of tests) and 29 of those (25.6% of tests) had a diagnosis of trisomy 21 (Down's syndrome).

Congenital anomalies screening

The number of women who gave consent for a foetal anomaly scan was 11,445 (92.3 %) and 9,349 women had a record of the scan being performed**.**

Chapter Contents

1.1. Aims of Pregnancy Screening Programmes

Antenatal haemoglobinopathies screening for sickle cell and thalassaemia aims to identify couples who are at risk of having an affected child and thereby offer them information on which to base reproductive choices.

Communicable diseases in pregnancy screening aims to identify infection and ensure a plan for treatment and management of affected individuals and their babies is put in place at the earliest opportunity. Screening allows undiagnosed infection to be identified and treatment to be given, which can reduce the risk of mother to child transmission, improve the long-term outcome and development of affected children, and ensure that women, their partners and families are offered appropriate referral, testing and treatment.

Down's syndrome and other congenital anomalies screening aims to detect Down's syndrome and other congenital anomalies in the antenatal period. This provides women and their partners with informed choice regarding continuation of pregnancy. It also allows, where appropriate, management options (such as cardiac surgery or delivery in a specialist unit) to be offered in the antenatal period.

1.2. Eligible Population

The pregnancy screening programmes are offered universally to all pregnant women during antenatal visits.

1.3. The Screening Tests

Appendix 1.1 illustrates the gestational age when pregnancy tests are carried out. All pregnant women are offered pregnancy screening for the following conditions.

Antenatal haemoglobinopathies screening

The pregnant woman and her partner are asked to complete a family origin questionnaire (**see appendix 1.3**). The information from the questionnaire is used to assess the risk of either parent being a carrier for sickle cell and other haemoglobin variants.

In addition, a blood test is taken at the first antenatal booking to screen the woman for sickle cell, thalassaemia and other haemoglobin variants. Where testing shows that the woman is a carrier, the baby's father will also be offered testing. The full screening pathway is shown in **Appendix 1.2 and Appendix 1.4.**

Screening for sickle cell disorders and thalassaemia should be offered to all women as early as possible in pregnancy, and ideally by 10 weeks for women to make a decision on whether to continue with the pregnancy.

1.4. Infectious diseases in pregnancy screening

Testing for HIV, hepatitis B and syphilis infection is carried out at first antenatal booking when a blood sample is taken. The full screening pathway is shown in **Appendix 1.5**, **Appendix 1.6**, **Appendix 1.7**, **Appendix 1.8** and **Appendix 1.9**.

Down's syndrome and other congenital anomalies

Screening for **Down's syndrome** can be carried out using two different screening methods depending on gestational age. The screening tests, using blood and ultrasound scans, together with maternal risk factors, are used to derive an overall risk of having a baby with Down's syndrome. The full screening pathway is shown in **Appendix 1.10**. Ultrasound scanning is used to look for other **congenital anomalies** between 18 and 21 weeks.

The decision to accept screening for Down's syndrome and other congenital anomalies raises particular ethical issues for women. Uptake of Down's syndrome or other congenital anomalies screening depends on whether women would wish further investigation or management.

1.5. Delivery of NHSGGC Pregnancy Screening Programmes

Each NHS Board has a statutory requirement to submit data on antenatal activity. In NHSGGC, there were 14,791 women booked to attend antenatal clinics 12,396 (83.8%) were local residents and 2,510 (16.9%) were from outwith the Health Board area **(Table 1.1).**

Table 1.1 Number of women booked for their first antenatal appointments in NHSGGC 1 April 2017 to 31 March 2018

Maternity Unit	Bookers Not NHSGGC Residents	Bookers NHSGGC Residents	Bookers Total
Not assigned to a unit	319	144	463
Princess Royal Maternity Hospital (PRM)	1,343	3,796	5,123
Queen Elizabeth University Hospital (QUEH)	519	5,397	5,860
Royal Alexandra Hospital (RAH)	322	3,059	3,338
Total	**2,510**	**12,396**	**14,791**

Source: PNBS and BadgerNet December 2018

Using Onomap software we identified the ethnic origin of pregnant women as follows White British 8677 (70%), Asian Pakistani 597 (4.8%), Asian Indian 259 (2.1%), Black African 170, (1.4%), Chinese 144 (1.2%) and 485 (3.9%) of any other ethnic group **(Table 1.2).**

Table 1.2 Number of NHSGGC residents booked for their first antenatal appointment by ethnic origin during 1 April 2017 to 31 March 2018

2001 Census Ethnic Group	Number	%
White - British	8,677	*70.0*
White - Irish	743	*6.0*
White - any other white background	848	*6.8*
Asian or Asian British - Indian	259	*2.1*
Asian or Asian British - Pakistani	597	*4.8*
Asian or Asian British - Bangladeshi	41	*0.3*
Asian or Asian British - Any Other Asian Background	20	*0.1*
Black or Black British - Caribbean	1	*0.0*
Black or Black British - African	170	*1.4*
Other ethnic groups - Chinese	144	*1.2*
Other ethnic groups - any other ethnic group	485	*3.9*
Unclassified	411	*3.3*
Total	**12,396**	

Source: Pregnancy & Newborn Screening System and BadgerNet, OnoMap, Dec 2018

In NHSGGC, 10,311(83.2%) of first antenatal booking appointments were offered within 12 weeks and 6 days of gestational age. 79.9% of pregnant women living in the most deprived areas booked by 12 weeks and 6 days compared to 87.6% of women living in the least deprived areas. Work continues to engage with and support women from more deprived areas to book earlier **(Table 1.3).**

Table 1.3 Gestational age at first antenatal booking appointment by deprivation categories for period 1 April 2017 to 31 March 2018

SIMD 2012 Quintile	Not Recorded	<=12 Wks 6Days	13Wks 0Days - 16Wks 6Days	17Wks 0Days - 20Wks 6Days	21Wks 0Days - 24Wks 6Days	25Wks 0Days - 30Wks 6Days	>=31 Wks 0Days	Total	% <=12wks 6Dys
1	402	4,155	403	115	52	35	37	5,199	*79.9*
2	142	1,677	99	34	14	14	7	1,987	*84.4*
3	123	1,341	62	18	5	12	7	1,568	*85.5*
4	123	1,312	78	21	9	9	6	1,558	*84.2*
5	140	1,826	92	9	1	2	14	2,084	*87.6*
Total	930	10,311	734	197	81	72	71	12,396	*83.2*

Source: Pregnancy & Newborn Screening System and BadgerNet, Dec 2018

1.6. Gestational Diabetes Mellitus (GDM)

Women with gestational diabetes are at increased risk of having a large baby, a stillborn baby or a baby who dies shortly after birth. Of the 1053 women with a BMI over 35, eight had a current diagnosis for type 1 or 2 diabetes**. (Table 1.4)**

Table 1.4 Number and percentage of women booked for their first antenatal appointments by body mass index and current diabetes 1 April 2017 to 31 March 2018

	Current Diabetes				
Body Mass Index Categories	**Not Recorded**	**No**	**Yes Type 1**	**Yes Type 2**	**Total**
Not Recorded	234	300	3	2	539
BMI<18.5	0	296	1	0	297
18.5<=BMI<25	23	5,322	12	4	5,361
25<=BMI<30	17	3,337	21	6	3,381
30<=BMI<35	11	1,732	12	10	1,765
35<=BMI<40	1	685	1	3	690
40<=BMI<45	1	256	0	3	260
BMI>=45	0	102	1	0	103
Total	**287**	**12,030**	**51**	**28**	**12,396**

Source: PNBS and BadgerNet December 2018

Within NHSGGC, the assessment of pregnant women and risks associated with GDM are based on a BMI>= 35, previous macrosomic baby, (weighing >4 kg at birth) family history of diabetes, previous gestational diabetes and mother's ethnic origin. 3,471 (28.2%) of bookers were recorded as having 'any risk' of GDM and were eligible to be offered an OGTT at 24-28 weeks gestation**. (Table 1.5)**

Table 1.5 Number of women booked for their first antenatal appointments in NHSGGC 1 April 2016 to 31 March 2017 and GDM risk factors

Maternity Unit	BMI >=35	Previous Macrosomic Baby	Family History Diabetes	Previous Gestational Diabetes	Origin Mother Risk	Any Risk*	Bookers Total	% Any Risk
Not assigned to unit	5	0	9	1	22	33	140	*23.6*
Princess Royal Maternity Hospital (PRM)	343	18	312	36	534	1057	3775	*28.0*
Queen Elizabeth University Hospital (QEUH)	385	45	595	44	964	1624	5365	*30.3*
Royal Alexandra Hospital (RAH)	312	25	394	74	123	757	3037	*24.9*
Total	1045	88	1310	155	1643	3471	12317	*28.2*

Source: BadgerNet, July 2018 * Summed individual risks may exceed any risk total

1.7. Body Mass Index (BMI) and Pregnant Women

5,361 (43.2%) of pregnant women had a normal weight at the time of their first antenatal booking appointment. 3,381 (27.3%) pregnant women were overweight and 1765(14.2%) were obese and 1053 (8.5%) were severely obese (35<=BMI >=45) **(Table 1.6).**

Obesity is a risk factor for gestational diabetes. Within NHSGGC, we are offering support to obese pregnant women by allowing them to access the Live Active Programme. Maternity staff have been trained to support pregnant women by providing information on suitable diet and exercise options during pregnancy

Table 1.6 Number and percentage of women booked for their first antenatal appointments by body mass index and by maternity unit from 1 April 2017 to 31 March 2018

	Maternity Unit									
BMI Category	**Not assigned to a unit**	***%***	**Princess Royal Maternity Hospital (PRM)**	***%***	**Queen Elizabeth University Hospital (QEUH)**	***%***	**Royal Alexandra Hospital (RAH)**	***%***	**Total**	***%***
BMI Not Recorded	31	*21.5*	208	*5.5*	198	*3.7*	102	*3.3*	539	*4.3*
Underweight BMI<18.5	4	*2.8*	78	*2.1*	151	*2.8*	64	*2.1*	297	*2.4*
Normal 18.5<=BMI<25	49	*34.0*	1,577	*41.5*	2,556	*47.4*	1,179	*38.5*	5,361	*43.2*
Overweight 25<=BMI<30	45	*31.3*	1,012	*26.7*	1,426	*26.4*	898	*29.4*	3,381	*27.3*
Obese 30<=BMI<35	8	*5.6*	577	*15.2*	678	*12.6*	502	*16.4*	1,765	*14.2*
Severely Obese 35<=BMI<40	2	*1.4*	221	*5.8*	265	*4.9*	202	*6.6*	690	*5.6*
Severely Obese 40<=BMI<45	4	*2.8*	82	*2.2*	90	*1.7*	84	*2.7*	260	*2.1*
Severely Obese BMI>=45	1	*0.7*	41	*1.1*	33	*0.6*	28	*0.9*	103	*0.8*
Total	**144**		**3,796**		**5,397**		**3,059**		**12,396**	

Source: PNBS and BadgerNet; Trakcare Dec 2018

1.8. NHSGGC Antenatal Haemoglobinopathies Screening Programme

Haemoglobinopathies

The haemoglobinopathies are a large group of inherited blood disorders which affect the haemoglobin (oxygen carrying) component of blood. They fall into two main groups – the haemoglobin variants (such as sickle cell disorders) which are associated with the production of abnormal forms of haemoglobin, and the Thalassaemia in which there is an abnormality in the amount of haemoglobin produced.

Sickle cell disorders, caused by a haemoglobin variant HbS, often result in severe life threatening clinical symptoms. Those with beta thalassaemia major require regular blood transfusions to maintain life. All pregnant women will be offered screening for haemoglobinopathies based on a low prevalence screening model.

Hb D (Hb AD) is one of the haemoglobinopathy carrier traits. The person has inherited haemoglobin A from one parent and haemoglobin D from the other. They will not have an illness, not experience symptoms but the carrier status is important for future reproduction.

Hb E (HbAE) is another haemoglobinopathy carrier trait. The person has inherited haemoglobin A from one parent and haemoglobin E from the other. They will not have an illness, not experience symptoms but the carrier status is important for future reproduction.

The screening pathways for haemoglobinopathy screening are in appendix 1.2, appendix 1.3 and appendix 1.4.

Samples taken for haemoglobinopathies screening

Of the 12,396 women booked for their first antenatal booking, 12,072 (97.3%) consented and had a sample taken for haemoglobinopathies screening (performed), 10 refused and 307 were not asked, not known or data not available. The blood is checked for risk of thalassaemia for all women who consented. **(Table 1.7).**

Table 1.7 NHSGGC Number of women who consented for haemoglobinopathies screening from 1 April 2017 to 31 March 2018

Maternity Unit	Not Known	Performed	Refused	Total
Not assigned to a unit	32	110	2	144
Princess Royal Maternity Hospital (PRM)	121	3674	1	3796
Queen Elizabeth University Hospital (QEUH)	109	5281	7	5397
Royal Alexandra Hospital (RAH)	45	3007	7	3059
Total	**307**	**12072**	**10**	**12396**

Source: PNBS and BadgerNet Dec 2018

The Family Origin Questionnaire (FOQ) is completed as part of routine early antenatal risk assessment. For low prevalence areas like NHSGGC, it provides the basis for testing for haemoglobin variants and in the interpretation of results and the need for partner testing. Electronic data was available for 7,708 (62.1%) women who had a completed FOQ. A paper based FOQ was in use following changes to IT application - data could not been captured electronically **(Table 1.8).**

Table 1.8 Number of women who completed FOQ from 1 April 2017 to 31 March 2018 in NHSGGC

	Family Origin Questionnaire		
Maternity Unit	**Completed Electronically**	**Number of bookers**	**% FOQ Completed electronically**
Not assigned to a unit	106	144	*73.6*
Princess Royal Maternity Hospital (PRM)	2363	3796	*62.2*
Queen Elizabeth University Hospital (QEUH)	3366	5397	*62.3*
Royal Alexandra Hospital (RAH)	1873	3059	*61.2*
Total	**7708**	**12396**	***62.1***

Source: PNBS, BADGERNET, TRAK, December 2018

Screening outcomes for antenatal haemoglobinopathies screening was available for 11,239 women (90.67%). Depending on the outcome, or in the absence of FOQ, booking samples are tested for haemoglobinopathies and thalassaemia.

Partner testing was recommended to couples where the woman is a carrier for HbS or thalassaemia.

The samples tested for haemoglobinopathies identified 63 as sickle cell carriers (HbAS), 5 women as Hb D carriers (HbAD) and 13 women as HbE carriers (HbAE) **(Table 1.9).**

Table 1.9 Antenatal Haemoglobinopathy screening outcome by Maternity hub, for the period 1 April 2017 to 31 March 2018

Antenatal Haemoglobinopathies Screening Outcome	Not assigned to a unit	Princess Royal Maternity Hospital (PRM)	Queen Elizabeth University Hospital (QEUH)	Royal Alexandra Hospital (RAH)	Total
Carrier of Hereditary Persistence of Foetal Haemoglobin.	0	0	1	0	1
Hb C carrier (HbAC)	2	1	1	4	8
Hb D carrier (HbAD).	1	3	1	0	5
Hb E carrier (HbAE).	3	3	1	6	13
No evidence of sickle haemoglobin.	5	975	1,538	1,067	3,585
None Recorded	19	596	899	221	1,735
Not tested for Hb variants as mother from low risk area.	49	1,257	1,655	1,361	4,322
Sickle cell carrier (HbAS).	11	17	15	20	63
Beta thalassaemia carrier	0	10	17	5	32
Possible iron deficiency and/or alpha + thal carrier	0	72	118	28	218
Possible alpha zero thal carrier and/or iron deficiency	0	27	56	15	98
No evidence of Abnormal Hb or Thalassaemia	0	454	606	121	1181
Total Number Outcomes	90	3,409	4,896	2,844	11,239
Number Women Booked	144	3,796	5,397	3,059	12,396
% Outcome Available	62.50%	89.81%	90.72%	92.97%	90.67%

Source: PNBS and BN, July 2018

The outcomes for thalassaemia screening identified 32 women as Beta Thalassaemia carriers and 316 as possible Alpha Zero Thalassaemia carrier and/or iron deficiency. **(Table 1.9)**

1.9. NHSGGC Infectious Diseases in Pregnancy Screening

Infectious Diseases

These include Hepatitis B, Syphilis and Human Immunodeficiency Virus (HIV): **Hepatitis B** infection can be passed on from mother to baby during birth. HBV is a virus that affects the liver. Babies can be immunised at birth to prevent being infected from mothers.

Syphilis is an infection that can damage the health of both mother and baby if not treated with antibiotics.

Human Immunodeficiency Virus (HIV) infected women can pass HIV to their babies during pregnancy, childbirth and through breastfeeding. Many women with HIV will not know that they are infected unless they are tested.

Screening tests and results for Infectious diseases

An estimate of the percentage uptake of each of the tests has been calculated by dividing the number requesting the test by the total number of samples.

The number of women referred for booking cannot be used as the denominator to calculate uptake as it is does not accurately represent the number of women who have been offered screening. Some women would not have been offered screening because they have had an early pregnancy loss. A small number of women will transfer out of the health board area.

Uptake across NHSGGC was greater than 99% for all of the screening tests. The screening identified 16 women infected with HIV (15 were previously known) and 46 infected with HBV (33 were previously known) and 5 women affected with syphilis **(Table 1.10).**

Table 1.10 NHSGGC Infectious diseases tests and results

1 April 2017 - 31 March 2018					Results			
	Total no. of samples	No. requesting individual test	No. not requesting individual test	Uptake	Antibody detected[1,2,]		Antibody not detected	
	(N)	(N)	(N)	%	(N)	%	(N)	%
HIV	14,986	14,971	15	99.9	16[1]	0.1	14,955	99.9
HBV	14,986	14,977	9	99.9	46[2]	0.3	14,931	99.7
Syphilis	14,986	14,976	10	99.9	5	0.03	14,971	99.9

Sources: West of Scotland Specialist Virology Centre

Notes:

1. 15 of the 16 HIV infections were previously known about
2. 33 of the 46 HBV infections were previously known about

1.10. NHSGGC Down's syndrome and Other Congenital Anomalies Screening Programme

Down's syndrome is characterised an extra copy of chromosome 21 (trisomy 21) and older mothers are more likely to have a baby with Down's syndrome although it can occur in women of any age.

1.11. 1st and 2nd Trimester Down's syndrome screening

Of the 12,396 women booked at antenatal clinics, 10,244 (82.6%) were tested either for the 1st or 2nd Trimester. 164 high risk results were recorded for the 1st Trimester and 81 for the 2nd Trimester Down's syndrome screening **(Table 1.11).**

Table 1.11 NHS Greater Glasgow & Clyde Residents. Down's syndrome screening and sample taken either at 1st or 2nd Trimester & Overall Risk 2017-18

Maternity Unit	No. of samples tested	High risk result 1st Trimester	High risk result 2nd Trimester	% high risk results	Total no. of samples
Not assigned to a unit	144	0	3	2.0	144
Princess Royal Maternity Hospital (PRM)	3,970	59	37	2.5	3,970
Queen Elizabeth University Hospital (QEUH)	4,151	73	31	1.9	4,151
Royal Alexandra Hospital (RAH)	2,123	32	10	1.4	2,123
Total	**10,244**	**164**	**81**	**2.0**	**10,244**

Source: Lothian and Bolton laboratories Dec 2018

Amniocentesis

227 amniocentesis samples were analysed by the Cytogenetics Laboratory and 59 abnormalities were detected (26%) and of these 41 (18%) had a diagnosis of trisomy 21 (Down's syndrome) **(Table 1.12).**

Table 1.12 Cytogenetics analysis of amniocentesis samples by indication type for the period 1 April 2017 - 31 March 2018

	Biochemical Screening	Maternal Age	Abnormalities on Scan	Other	Total
Number of women (=number of tests)	92	5	81	49	**227**
% total referral reasons	41.4%	2.2%	35.6%	21.5%	**100%**
Number with normal results	83	5	40	40	**168**
Number with diagnostic trisomy	6	0	28	7	**41**
% number with diagnostic trisomy	6.3%	0%	34.5%	14.2%	**18%**
Number of other non trisomy abnormalities	3	0	13	2	**18**
Total number of abnormalities	9	0	41	9	**59**
% total number of abnormalities	**15.2%**	**0%**	**69%**	**15%**	**26%**

Source: Cytogenetics Laboratory January 2019

Chorionic Villus Biopsies (CVS)

113 chorionic villus biopsies were analysed by the Cytogenetics Laboratory in 2017/18. 45 abnormalities were detected (40%) and 29 of those (25.6%) had a diagnosis of trisomy 21 (Down's syndrome) **(Table 1.13).**

Table 1.13 Cytogenetics analysis outcomes of chorionic Villus Biopsy samples by indication for the period 1 April 2016 - 31 March 2017

	Referral Type				
	Biochemical Screening	**Maternal Age**	**Abnormalities on Scan**	**Other**	**Total**
Number of women (= number of tests)	12	3	61	37	**113**
% total referral reasons	10.3%	2.6%	54%	32.7%	**100%**
Number with normal results	8	3	30	27	**68**
Number with diagnostic trisomy	4	0	23	2	**29**
% total with diagnostic trisomy	33.3%	0%	37.7%	5.4%	**25.6%**
Number of other non trisomy abnormalities	0	0	8	8	**16**
Total number of abnormalities	4	0	31	10	**45**
% total number of abnormalities	**8.8%**	**0%**	**68.8%**	**22.2%**	**40%**

Source: Cytogenetics Laboratory January 2019

1.12. Other Congenital Anomalies Screening

Fetal Anomalies Scan

All women are offered an ultrasound scan between 18 and 21 weeks to confirm the gestation age and identify any possible problems that may require medical intervention during pregnancy or after birth.

The number of women who gave consent for a fetal anomaly scan was 11, 445 (92.3 %) and 9,349 scans were performed **(Table 1.13).**

Table 1.13 Uptake rate for other congenital anomalies (fetal anomaly scan) for the period 31 March 2017 to 1 April 2018

Maternity Unit	Number of bookers	Number of Consents	% Consented	Number of fetal anomaly scans performed	% fetal anomaly scans performed	% Uptake
Not assigned to a unit	144	118	*81.9*	74	*62.71*	*51.4*
Princess Royal Maternity Hospital (PRM)	3,796	3,576	*94.2*	2,980	*83.33*	*78.5*
Queen Elizabeth University Hospital (QEUH)	5,397	4,965	*92.0*	3,945	*79.46*	*73.1*
Royal Alexandra Hospital (RAH)	3,059	2,786	*91.1*	2,350	*84.35*	*76.8*
Total	**12,396**	**11,445**	***92.3***	**9,349**	***81.69***	***75.4***

Source: PNBS, BADGERNET and Trakcare , December 2018

10,056 fetal scans were performed, 112 anomalies were suspected but not confirmed and 7 anomalies were present **(Table 1.14).** Detailed outcome data is not available in electronic format.

Table 1.14 Outcome of fetal anomaly scans performed for the period 1 April 2017 to 31 March 2018

	Fetal Anomaly Status				
Maternity Unit	**Null**	**Anomaly present**	**Anomaly suspected but not confirmed**	**No Anomaly seen**	**Total**
Not assigned to a unit	6	0	2	66	74
Princess Royal Maternity Hospital (PRM)	198	2	60	2,911	3,171
Queen Elizabeth University Hospital (QEUH)	338	1	27	3,938	4,304
Royal Alexandra Hospital (RAH)	250	4	23	2,230	2,507
Total	**792**	**7**	**112**	**9,145**	**10,056**

Source: BADGERNET, July 2018

1.13. Information Systems

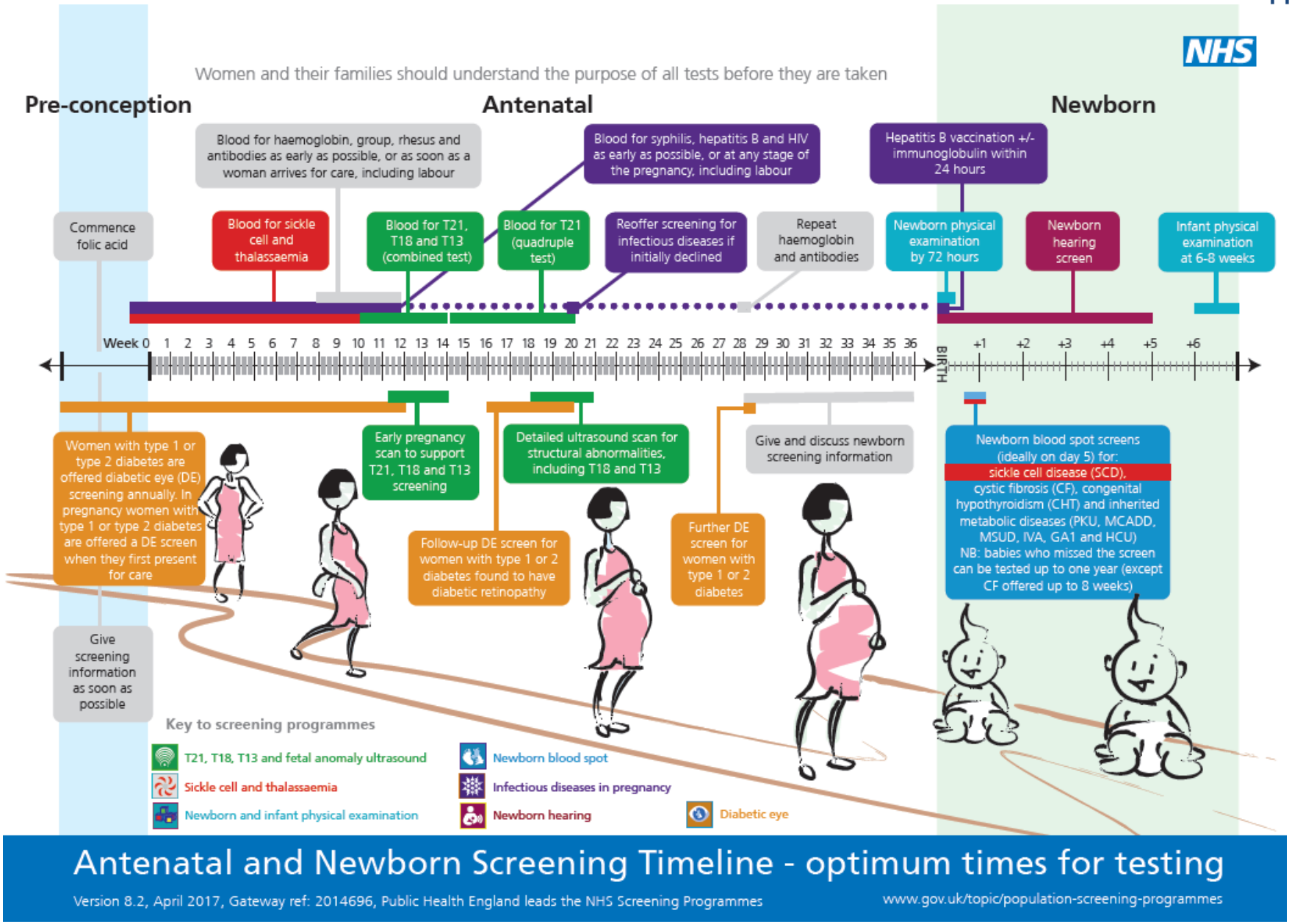
The BadgerNet It system replaced the local PNBS IT application in November 2017. The report contains data extracted from both systems for the period April 2017 to March 2018.

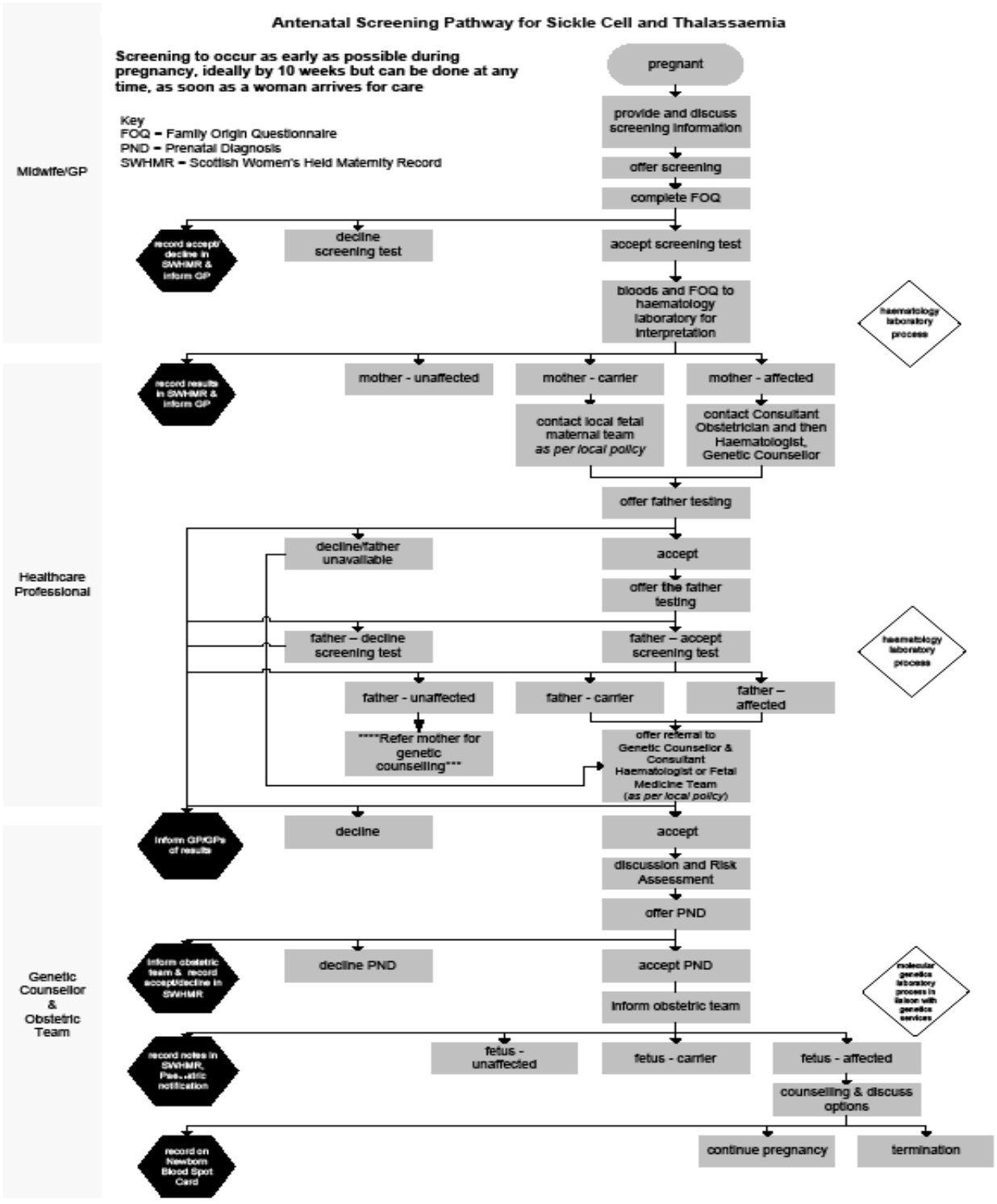
Some data related to haemoglobinopathies has not been captured in electronic format due to use of FOQ paper requests.

Future reports will rely on data from BadgerNet and Laboratory reports from those commissioned nationally e.g. Lothian for the 1st Trimester and Bolton for the 2nd Trimester Down's syndrome screening.

1.14. Challenges and Priorities

- Meeting the testing and reporting timelines for pregnancy screening programmes
- Reviewing all pregnancy data from BadgerNet and addressing any quality issues.
- Resolving the issues around the re-engineering of 1st and 2nd Trimester Down's syndrome screening as part of a national solution.


NHS
Women and their families should understand the purpose of all tests before they are taken
Pre-conception
Antenatal
Newborn
Blood for haemoglobin, group, rhesus and antibodies as early as possible, or as soon as a woman arrives for care, including labour
Blood for syphilis, hepatitis B and HIV as early as possible, or at any stage of the pregnancy, including labour
Hepatitis B vaccination +/- immunoglobulin within 24 hours
Commence folic acid
Blood for sickle cell and thalassaemia
Blood for T21, T18 and T13 (combined test)
Blood for T21 (quadruple test)
Reoffer screening for infectious diseases if initially declined
Repeat haemoglobin and antibodies
Newborn physical examination by 72 hours
Newborn hearing screen
Infant physical examination at 6-8 weeks
Week 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
BIRTH
+1 +2 +3 +4 +5 +6
Women with type 1 or type 2 diabetes are offered diabetic eye (DE) screening annually. In pregnancy women with type 1 or type 2 diabetes are offered a DE screen when they first present for care
Early pregnancy scan to support T21, T18 and T13 screening
Detailed ultrasound scan for structural abnormalities, including T18 and T13
Give and discuss newborn screening information
Newborn blood spot screens (ideally on day 5) for:
sickle cell disease (SCD),
cystic fibrosis (CF), congenital hypothyroidism (CHT) and inherited metabolic diseases (PKU, MCADD, MSUD, IVA, GA1 and HCU)
NB: babies who missed the screen can be tested up to one year (except CF offered up to 8 weeks)
Follow-up DE screen for women with type 1 or 2 diabetes found to have diabetic retinopathy
Further DE screen for women with type 1 or 2 diabetes
Give screening information as soon as possible
Key to screening programmes
T21, T18, T13 and fetal anomaly ultrasound
Sickle cell and thalassaemia
Newborn and infant physical examination
Newborn blood spot
Infectious diseases in pregnancy
Newborn hearing
Diabetic eye
Antenatal and Newborn Screening Timeline - optimum times for testing
Version 8.2, April 2017, Gateway ref: 2014696, Public Health England leads the NHS Screening Programmes
www.gov.uk/topic/population-screening-programmes


Antenatal Screening Pathway for Sickle Cell and Thalassaemia
Screening to occur as early as possible during pregnancy, ideally by 10 weeks but can be done at any time, as soon as a woman arrives for care
Key
FOQ = Family Origin Questionnaire
PND = Prenatal Diagnosis
SWHMR = Scottish Women's Held Maternity Record
Midwife/GP
Healthcare Professional
Genetic Counsellor & Obstetric Team
pregnant
provide and discuss screening information
offer screening
complete FOQ
record accept/decline in SWHMR & inform GP
decline screening test
accept screening test
bloods and FOQ to haematology laboratory for interpretation
haematology laboratory process
record results in SWHMR & inform GP
mother - unaffected
mother - carrier
mother - affected
contact local fetal maternal team as per local policy
contact Consultant Obstetrician and then Haematologist, Genetic Counsellor
offer father testing
decline/father unavailable
accept
offer the father testing
father – decline screening test
father – accept screening test
haematology laboratory process
father - unaffected
father - carrier
father – affected
****Refer mother for genetic counselling***
offer referral to Genetic Counsellor & Consultant Haematologist or Fetal Medicine Team (as per local policy)
Inform GP/GPs of results
decline
accept
discussion and Risk Assessment
offer PND
Inform obstetric team & record accept/decline in SWHMR
decline PND
accept PND
Inform obstetric team
'molecular' genetics laboratory process in liaison with genetics services
record notes in SWHMR, Paediatric notification
fetus - unaffected
fetus - carrier
fetus - affected
counselling & discuss options
record on Newborn Blood Spot Card
continue pregnancy
termination

Family Origin Questionnaire

NHS
Screening Programmes
Sickle Cell & Thalassaemia

If using a pre-printed label please attach one to each copy

Hospital Name .....
Hospital No .....
NHS No .....
Estimated Delivery Date .....
Surname .....
Forename .....
Date of Birth .....
Add1 .....
Add2 .....
Post Code .....

Screening test declined ☐
Do you want to give a reason why declined?
Yes .....
.....
.....
.....
No ☐

REPORT DESTINATION *(eg Community Midwife, GP, Antenatal Clinic, Obstetrician)* .....
.....

What are your family origins?

Please tick all boxes in ALL sections that apply to the woman and the baby's father

	Woman	Baby's father
A. AFRICAN OR AFRICAN-CARIBBEAN (BLACK)		
Caribbean Islands	☐	☐
Africa (excluding North Africa)	☐	☐
Any other African or African-Caribbean family origins (please write in…)		
B. SOUTH ASIAN (ASIAN)	Woman	Baby's father
India or African-Indian	☐	☐
Pakistan, Bangladesh	☐	☐
Sri Lanka	☐	☐
C. SOUTH EAST ASIAN (ASIAN)	Woman	Baby's father
China including Hong Kong, Taiwan, Singapore	☐ #	☐ #
Thailand, Indonesia, Burma	☐ #	☐ #
Malaysia, Vietnam, Philippines, Cambodia, Laos	☐ #	☐ #
Any other Asian family origins (please write in…) (e.g. Caribbean-Asian)		
D. OTHER NON-EUROPEAN (OTHER)	Woman	Baby's father
North Africa, South America etc	☐	☐
Middle East (Saudi Arabia, Iran etc)	☐	☐
Any other Non-European family origins (please write in…)		
E. SOUTHERN & OTHER EUROPEAN (WHITE)	Woman	Baby's father
Sardinia	☐ #	☐ #
Greece, Turkey, Cyprus	☐ #	☐ #
Italy, Portugal, Spain	☐	☐
Any other Mediterranean country	☐	☐
Albania, Czech Republic, Poland, Romania, Russia etc	☐	☐
F.* UNITED KINGDOM (WHITE) *refer to chart at the back*	Woman	Baby's father
England, Scotland, N Ireland, Wales	☐	☐
G.* NORTHERN EUROPEAN (WHITE) *refer to chart at the back*	Woman	Baby's father
Austria, Belgium, Ireland, France, Germany, Netherlands	☐	☐
Scandinavia, Switzerland etc	☐	☐
Any other European family origins, *refer to chart* (please write in) (e.g. Australia, N America, S Africa)		
* Hb Variant Screening Requested by (F) and/ or (G)	☐	☐

Higher risk for alpha zero thalassaemia

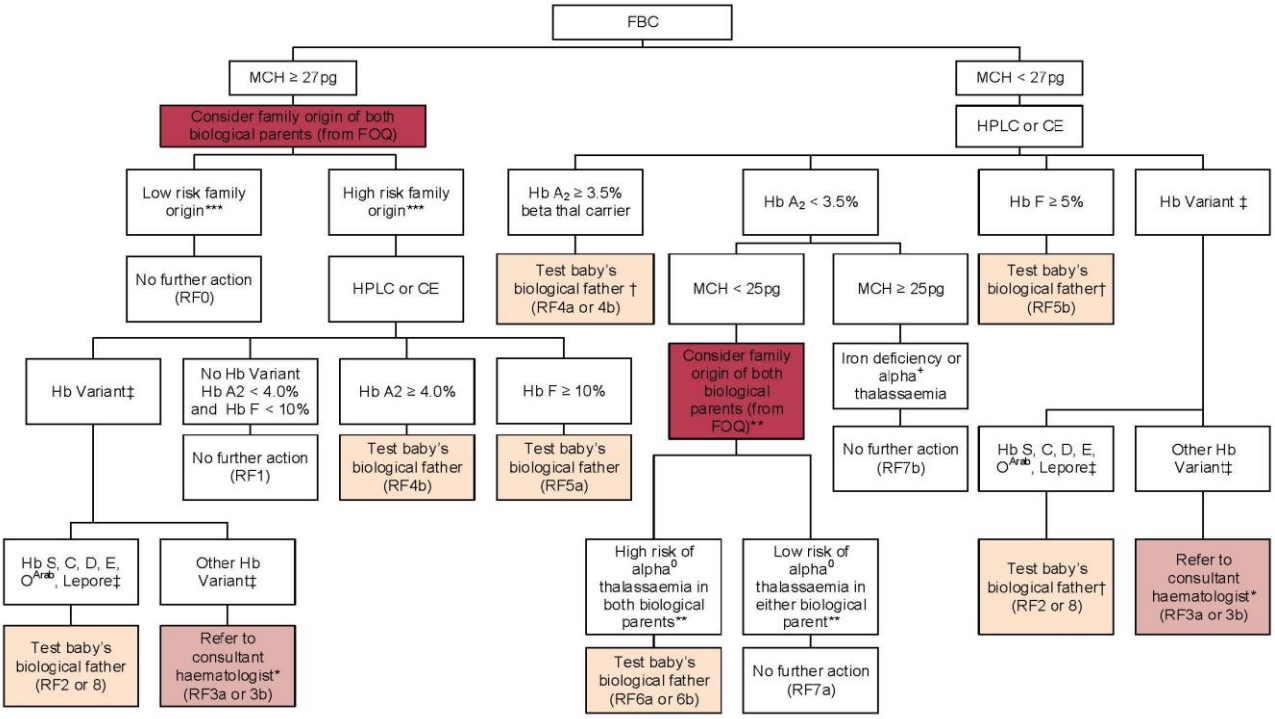
	Woman	Baby's father
H. DON'T KNOW adoption/unknown ancestry	☐	☐
donor egg/sperm	☐	☐
bone marrow transplant	☐	☐
I. DECLINED TO ANSWER	☐	☐
J. ESTIMATED DELIVERY DATE (please write in if not above)		
K. GESTATION AT TIME OF TEST		

All women need to be informed that routine analysis of blood may identify them as a thalassaemia carrier. In **low prevalence** areas OFFER haemoglobin variant screening to all women if they or the baby's father have answers in any yellow box. In **high prevalence** areas OFFER haemoglobin variant screening to all women irrespective of answers, ie. if they or the baby's father have answers in white and yellow boxes A - L.

Signed _____ Print Name _____ Job Title _____ Date _____
(By Health Care Professional Completing the Form)

The TOP (white) copy of this form must be attached securely to the laboratory antenatal booking request form and sent to the laboratory with the antenatal blood samples, the second (pink) copy is to be retained in the patient's maternity notes, third (yellow) copy to go into hospital notes or where appropriate. The completion of this form is an ESSENTIAL part of the screening programme for sickle cell & thalassaemia.

Haemoglobinopathy Screening in Low Prevalence Areas



* Refer analytical results to consultant for an opinion on the need for a clinical referral or consult the laboratory support s ervice helpline.

** Consider at high risk if any ethnic origins in China (including Hong Kong), Taiwan, Thailand, Cambodia, Laos, Vietnam, Indonesia, Burma, Malaysia, Singapore, Philippines, Cyprus, Greece, Sardinia, Turkey, or if ethnic/family origin is uncertain or unknown. Reconsider low risk couples if fetal anaemia/hydrops seen on ultrasound scanning or if family history of hydrops fetalis.

*** Low risk or high risk as determined by the family origin questionnaire. **Note: If baby's father is in high risk group, test the mother's sample regardless of her family origins.**

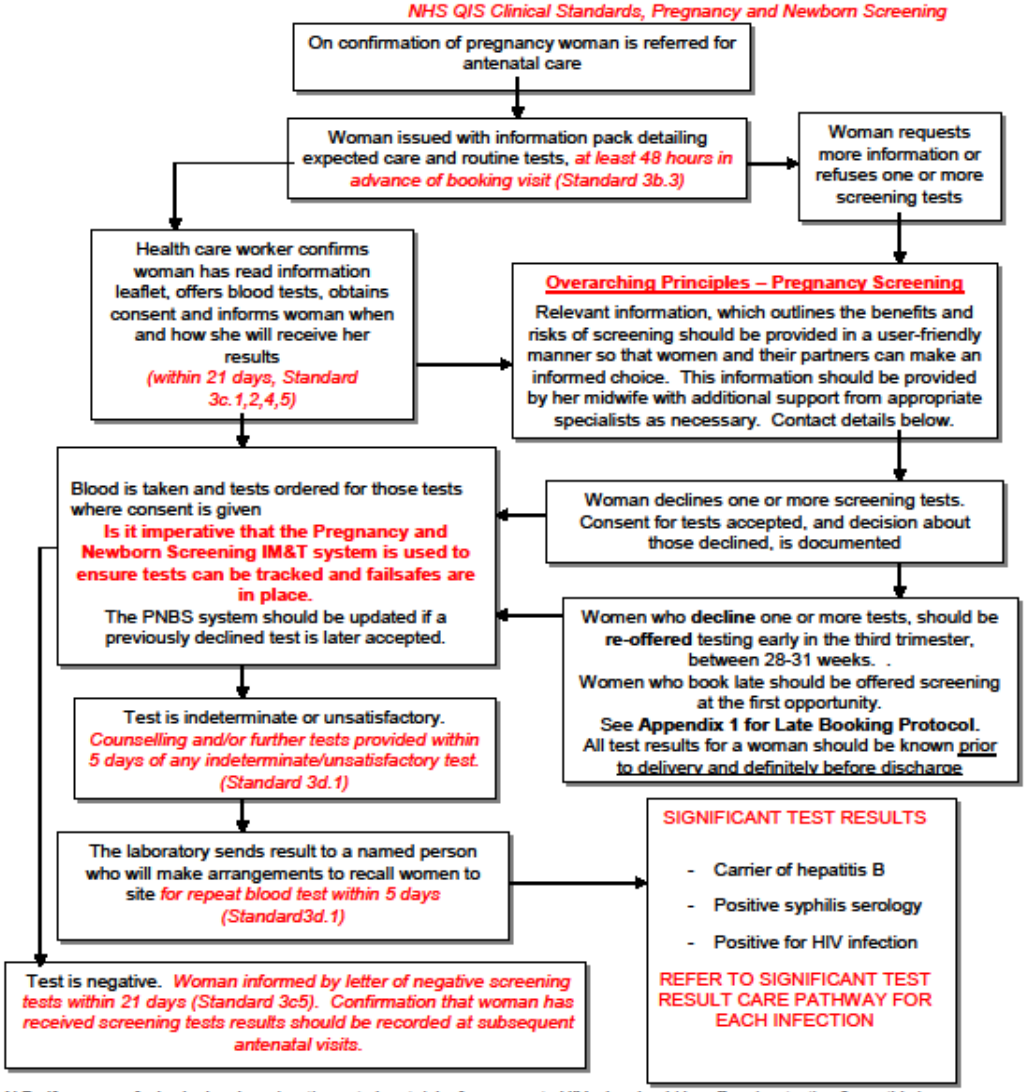
† In all cases consider coexisting α^0 thalassaemia if both parents are from a high risk area and MCH <25pg.

‡ Consider co-existing beta thalassaemia

Offering Routine Antenatal Communicable Disease Screening Tests

"The primary aim of screening women for these conditions is to ensure a plan for treatment and management for affected individuals and their babies".

NHS QIS Clinical Standards, Pregnancy and Newborn Screening



N.B. If a woman feels she has been/continues to be at risk of exposure to HIV, she should be offered re-testing 3 monthly in pregnancy. If a woman develops symptoms of hepatitis or an STI she should be referred to the relevant professional (hepatologist/SHA) for appropriate assessment.

Special Needs in Pregnancy (SNIPs) –RAH – 0141 314 6199 or 0141 887 9111 then page 56311 **VOL** – 01389 817 270
IRH – 01475 504 833 **Glasgow** - 0141 221 5267 or 0141 211 5366 or 0141 211 5337 (secretary)
Sexual Health Advisors, Sandyford – 0141 211 8634
Counselling and Support Team (CAST), Brownlee Centre 0141 211 1089

Version No	V5.3
Revised:	24 May 2016
Approved by:	Communicable Diseases in Pregnancy Steering Group
Date Approved:	April 2011
Next revision date:	May 2019

Appendix 1.6

Managing Communicable Diseases Screening Tests In Late Bookers

Late bookers are women who present for the first time on or after 24 weeks pregnancy. This is the stage at which the baby is potentially viable if early labour occurred.

The results of the communicable disease screening tests could affect the management at or after delivery, therefore all communicable disease screening test results for a woman should be known prior to delivery and certainly before discharge.

If a woman presents to maternity services as a late booker i.e. on or after 24 weeks it is important to ensure that screening has been offered and results are received:

1) The woman presents to the antenatal clinic, and there is no immediate risk of delivery:

- Seek informed consent for screening (HIV, Syphilis, hepatitis B)
- Fill one 9ml purple topped EDTA bottle and complete a virology request form, clearly indicating which tests (HIV, Syphilis hepatitis B) are to be carried out. Even if a woman does not consent to all four tests, please fill one 9ml purple topped EDTA bottle. Do not send two 5ml bottles, or other combinations to make up to 9 ml, the machines in the lab won't accept them and the sample will not be processed.
- Ensure tests are recorded on PNBS
- Mark the sample as URGENT and telephone the West of Scotland Specialist Virology Centre to let them know it is in the system. (Tel 0141 201 8722)
- Send the sample to the virus lab, via normal routine processes
- Ensure that the name and contact details of the person and a deputy who will be responsible for any positive results are clearly appended
- Note that to view a result on portal a CHI number is essential

2) The woman presents to maternity assessment i.e. in pain, bleeding etc therefore the risk of delivery is high:

- Seek informed consent for screening (HIV, Syphilis, hepatitis B, rubella)
- Fill one 9ml purple topped EDTA bottle and complete a virology request form, clearly indicating which tests (HIV, Syphilis hepatitis B) are to be carried out.
- Please fill one 9ml bottle regardless of how many tests are requested. Sending multiple 5 ml tubes is not acceptable and the sample will not be processed.
- Ensure tests are recorded on PNBS at next opportunity
- Mark the sample as 'URGENT'.
- In hours (i.e. 9.00 – 17.00 Monday – Friday and 9.00 – 12.30 Saturday), telephone the Laboratory (Tel 0141 201 8722) and
- Explain that an urgent sample is being sent
- Discuss the travel arrangements

- Arrange when and to whom the results will be communicated. You must provide the laboratory with adequate contact details to include the name and preferably two contact numbers of the main results recipient and a deputy.
- Out of hours you must telephone the on-call virologist via the Switchboard 0141 211 3000 and discuss the above.
- If the timing of the local transport systems does not facilitate urgent transfer order a taxi to ensure the sample reaches the laboratory. (see NHSGGC Amended Protocol Ordering and Use of Taxis and Couriers October 2011)

http://www.staffnet.ggc.scot.nhs.uk/Corporate%20Services/Communications/Briefs/Documents/amended%20taxi%20protocol%20-%20phase%201_acute%20services.pdf

In normal hours the lab is able to process and produce results within 1-2 hours of receipt. Note that reactive samples will need to be confirmed on the next day.

Note that to view a result on portal a CHI number is essential.

3) The woman presents in labour:

- It is the responsibility of the labour ward staff to ensure that virology screening tests are offered and results received. Even intrapartum diagnosis can significantly, positively modify neonatal outcome therefore it is important to ensure women are offered screening tests no matter how late.

- It is essential that you telephone the virology lab as soon as possible to discuss emergency testing of the woman.

- Seek informed consent for screening (HIV, Syphilis, hepatitis B,).

- Fill one 9ml purple topped EDTA bottle and complete a virology request form, clearly indicating which tests (HIV, Syphilis hepatitis B) are to be carried out.

- Please fill one 9ml bottle regardless of how many tests are requested. Sending multiple 5 ml tubes is not acceptable and the sample will not be processed.

- Mark the sample as ‘URGENT’.

- In hours (i.e. 9.00 – 17.00 Monday – Friday and 9.00 – 12.30 Saturday), telephone the Laboratory (Tel 0141 201 8722) and explain that an urgent sample is being sent discuss the travel arrangements.

- Arrange when and to whom the results will be communicated. You must provide the laboratory with adequate contact details to include the name and preferably two contact numbers of the main results recipient and a deputy.

- Out of hours you must telephone the on-call virologist via the Switchboard 0141 211 3000 and discuss the above.

- Order a taxi to ensure the sample reaches the laboratory (see NHSGGC Amended Protocol Ordering and Use of Taxis and Couriers October 2011).

http://www.staffnet.ggc.scot.nhs.uk/Corporate%20Services/Communications/Briefs/Documents/amended%20taxi%20protocol%20-%20phase%201_acute%20services.pdf

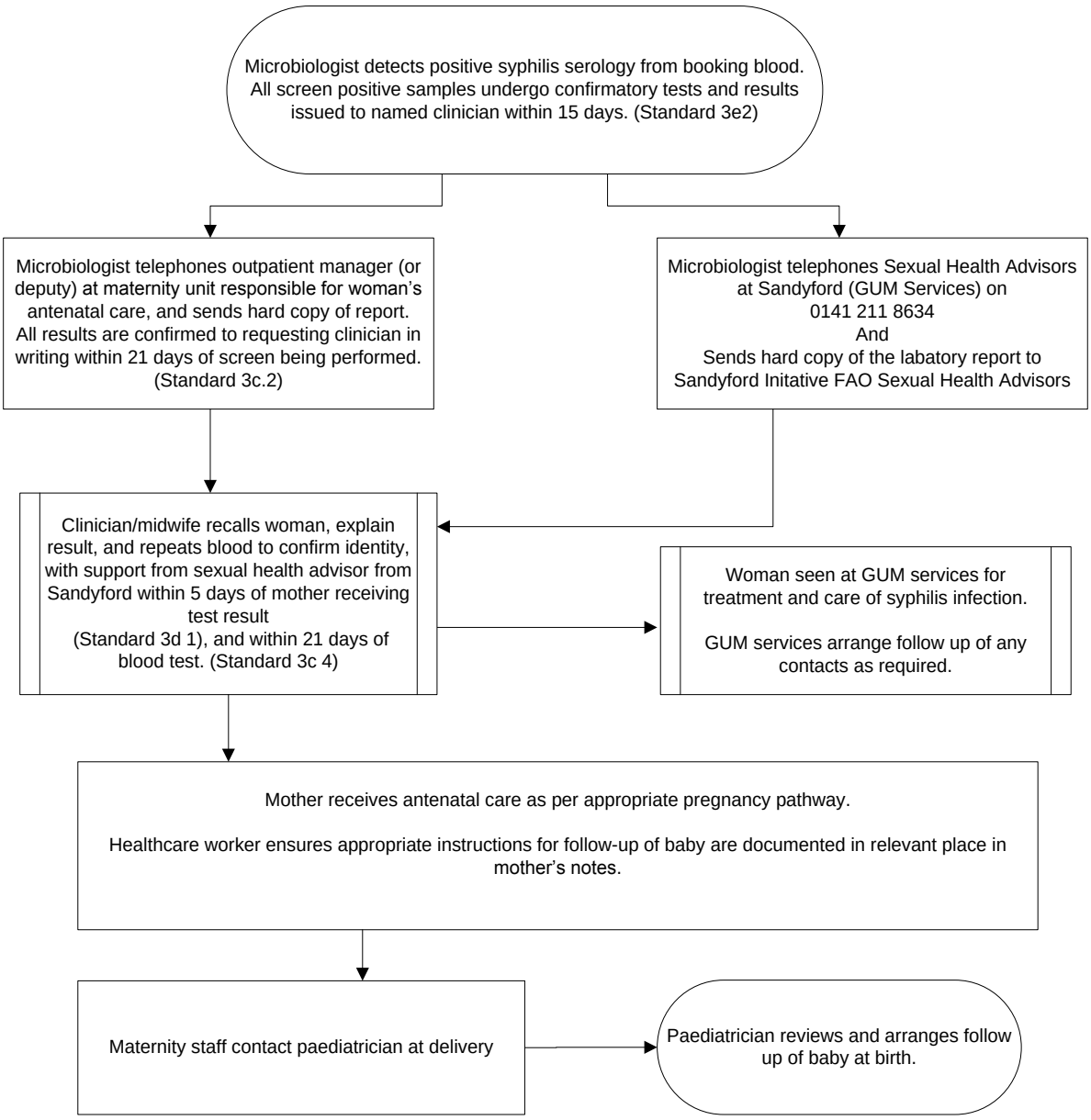
- As with ALL emergency blood tests ensure results are followed up immediately they are available. In normal hours the lab is able to process and produce results within 1-2 hours of receipt.

- Communication with paediatricians is essential as their management may be significantly altered by these results however the responsibility for taking and sending these investigations and obtaining these results remains with the midwifery / obstetric team.

- Ensure tests are recorded on PNBS at next opportunity.

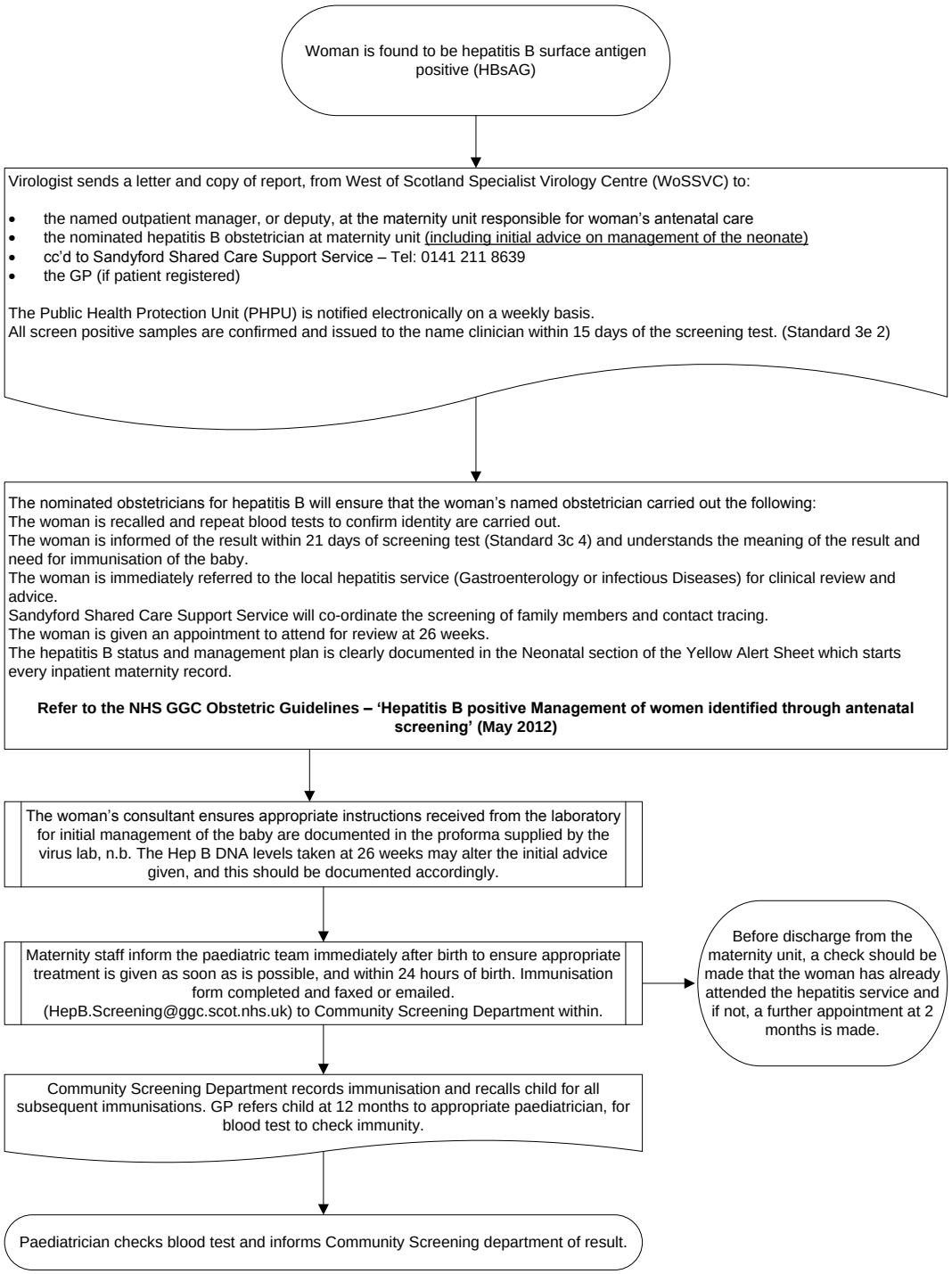
Protocol for Significant Laboratory Results

SYPHILIS



Version No:	V4.2
Approved by:	Communicable Diseases in Pregnancy Steering Group Lead Author Dr Gillian Penrice added 6.1.2016
Date Approved:	December 2011 Checked 1 2016
Next Revision Date:	December 2014 Next Review 31/01/2017

Protocol for Significant Laboratory Results
HEPATITIS B (HBsAG)

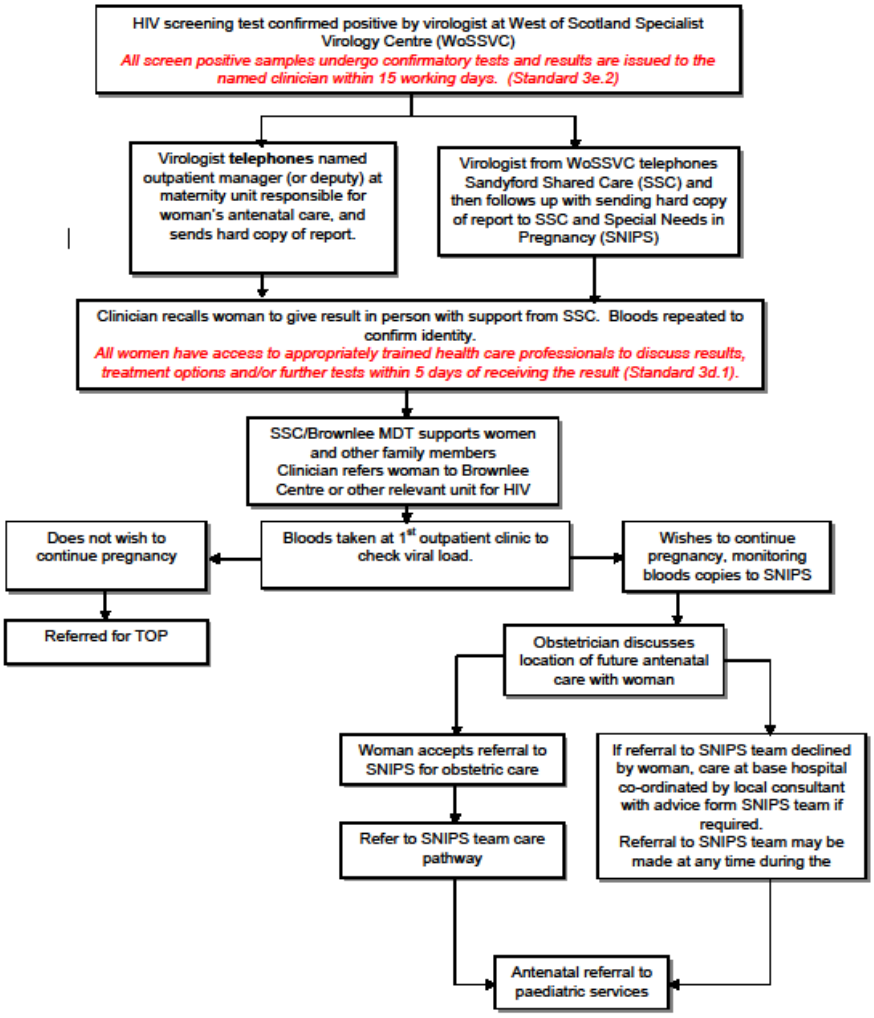


Version No:	2
Approved by:	Communicable Diseases in Pregnancy Steering Group Lead Author Dr Gillian Penrice added 5.1.16
Date Approved:	12.5.2014 on site – live from 16.6.2014
Next Revision Date:	June 2017

NHS Greater Glasgow and Clyde

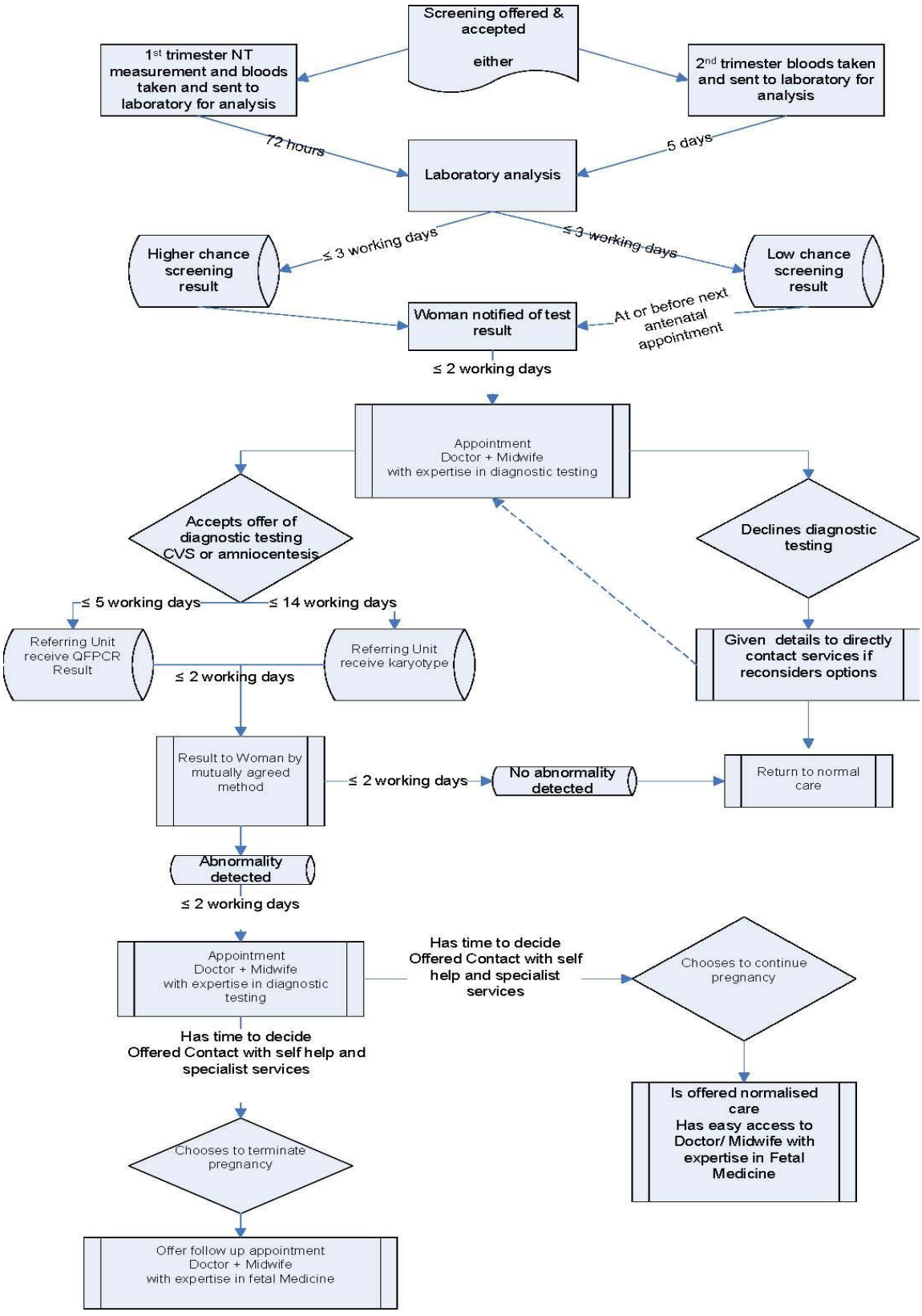
Protocol for Significant Laboratory Results

HIV



Version No: V5.1
Approved by: Communicable Diseases In Pregnancy Steering Group Lead Author - Dr Gillian Penrice added 5.1.2016
Date Approved: On site 12.6.14 Live from 16.6.14
Next revision date: June 2017

Down's syndrome screening pathway for women accepting screening



Members of Pregnancy Screening Steering Group
(as at March 2017)

Dr Emilia Crighton	Head of Health Services Section (Chair)
Ms Sally Amor	Health of Health Improvement, NHS Highland
Dr Catriona Bain	Clinical Director, Obstetrics and Gynaecology
Ms Donna-Maria Bean	Lead Sonographer (Obstetrics & Gynaecology)
Ms Vicki Brace	Consultant Obstetrician
Ms Louise Brown	West of Scotland Pregnancy Laboratory
Mr Paul Burton	Information Manager
Mrs Lin Calderwood	HI&T Screening Service Delivery Manager
Ms Pam Campbell	Site Health Records Manager
Ms Margaret Cartwright	Sector Laboratory Manager
Mrs Diana Clark	Lead Midwife
Dr Rosemarie Davidson	Consultant Clinical Geneticist
Ms Helen Devlin	Senior Charge Midwife
Mr Ian Fergus	Site Technical Manager, Diagnostics
Ms Dorothy Finlay	Lead Midwife
Ms Evelyn Frame	Chief Midwife
Mrs Elaine Garman	Public Health Specialist, NHS Highland
Mrs Jaki Lambert	Lead Midwife (Argyll and Bute)
Dr Robert Lindsay	Associate, Glasgow University
Ms Karen McAlpine	Lead Midwife
Miss Denise Lyden	Project Officer
Ms Marie-Elaine McClair	Interim Clinical Service Manager
Dr Louisa McIlwaine	Consultant Haematologist
Mrs Michelle McLauchlan	General Manager, Obstetrics
Ms Barbara McMenemy	Acute Addiction Manager
Dr Gillian Penrice	Consultant in Public Health Medicine
Mrs Uzma Rehman	Public Health Programme Manager
Mrs Elizabeth Rennie	Screening Programmes Manager
Dr Jim Robins	Consultant Obstetrician, Clyde
Ms Margaretha Van Mourik	Consultant Genetic Counsellor
Dr Nicola Williams	Head of Molecular Genetics

Appendix 1.12

Members of Communicable Diseases Steering Sub Group (As at March 2017)

Dr Gillian Penrice	Public Health Protection Unit (Chair)
Dr Tamer Abdelrahman	Honorary Virology Registrar
Ms Hilary Alba	Charge Midwife SNIPS team
Ms Donna Athanasopoulos	Information & Publications Manager
Ms Catrina Bain	Clinical Director Obstetrics and Gynaecology
Ms Elizabeth Boyd	Clinical Effectiveness Co-ordinator
Mr Paul Burton	Information Manager
Mrs Lin Calderwood	National Portfolio Programme Manager
Mrs Louise Carroll	Programme Manager HIV/STIs
Mrs Diana Clark	Lead Community Midwife
Ms Helen Devlin	Senior Charge Midwife
Ms Flora Dick	Special Needs (SNIPS) Midwife
Ms Rose Dougan	Special Needs (SNIPS) Midwife
Ms Elizabeth Ellis	Staff Grade
Ms Dorothy Finlay	Lead Midwife
Ms Catherine Frew	Data Analyst, Specialist Virology Centre
Mrs Fiona Gilchrist	Assistant Programme Manager
Ms Claire Glover	Clinical Nurse Specialist
Ms Louise Jack	Midwife
Mrs Jaki Lambert	Lead Midwife
Mr Sam King	Sexual Health Advisor
Miss Denise Lyden	Project Officer
Ms Victoria Mazzoni	Senior Community Midwife
Ms Karen McAlpine	Lead Midwife
Ms Valerie McAlpine	Senior Charge Midwife
Ms Marie-Elaine McClair	Interim Clinical Service Manager
Mrs Katie McEwan	Clinical Service Manager
Ms Michelle McLaughlan	General Manager, Obstetrics
Ms Jane McOwan	Technical Manager, Specialist Virology Centre
Ms Elizabeth Rennie	Programme Manager
Dr Jane Richmond	Obstetrician and Gynaecologist
Ms Linda Rhodick	Medical Secretary/Data Co-ordinator
Dr James Robins	Consultant Obstetrician & Gynaecologist
Ms Samantha Shepherd	Clinical Scientist
Ms Claire Stewart	Clinical Service Manager
Dr Andrew Thomson	Consultant Obstetrician & Gynaecologist

Chapter 2 – Newborn Bloodspot Screening

Summary

Newborn bloodspot screening identifies babies who may have rare but serious conditions. Most babies screened will not have any of the conditions, but for the small numbers that do, the benefits of screening are enormous. Early treatment can improve health and prevent severe disability or even death. Every baby born in Scotland is eligible for and routinely offered screening.

Newborn babies are screened for phenylketonuria; congenital hypothyroidism; cystic fibrosis; sickle cell haemoglobinopathy, medium chain acyl-CoA dehydrogenase deficiency (MCADD), maple syrup urine disease (MSUD), isovaleric acidaemia (IVA), glutaric aciduria type 1 (GA1), homcystinuria (pyridoxine unresponsive (HCU).

11,803 babies resident in NHSGGC were screened, that is a total of 98.1% of the total eligible population of 11,907. The uptake of screening ranged from 98.5% to 99.5% across HSCP geographical areas. 9,182 (75.2%) of babies screened were White, 926 (7.6%) South Asian and 605 (5.0%) were of Southern or Other European ethnicity.

Following screening, nine babies were diagnosed with congenital hypothyroidism (CHT) and less than five babies with PKU (phenylketonuria).

The cystic fibrosis results showed less than five babies tested positive, and less than five were carriers. For haemoglobinopathy, although less than five were diagnosed with sickle cell disease, 78 babies were identified as haemoglobinopathy carriers.

The phrase less than five has been used in line with NHS Scotland information governance which is intended to protect privacy and avoid identifying individuals.

Chapter Contents

2.1. Newborn Bloodspot Screening

Newborn bloodspot screening identifies babies who may have rare but serious conditions. Most babies screened will not have any of the conditions, but for the small numbers that do, the benefits of screening are enormous. Early treatment can improve health and prevent severe disability or even death. Every baby born in Scotland is eligible for and routinely offered screening.

Newborn bloodspot screening aims to identify, as early as possible, abnormalities in newborn babies which can lead to problems with growth and development, so that they may be offered appropriate management for the condition detected.

The diseases screened for are phenylketonuria; congenital hypothyroidism; cystic fibrosis; sickle cell haemoglobinopathy, medium chain acyl-CoA dehydrogenase deficiency (MCADD), maple syrup urine disease (MSUD), isovaleric acidaemia (IVA), glutaric aciduria type 1 (GA1), homcystinuria (pyridoxine unresponsive (HCU).

2.2. Eligible Population

Newborn Bloodspot screening is offered to all newborns. Eligible babies is the total number of babies born within the reporting period (2017-18), excluding any baby who died before the age of 8 days.

2.3. The Screening Test

The bloodspot sample should be taken on day 5 of life whenever possible. There are separate protocols in place for screening babies who are ill, have a blood transfusion or are born prematurely and when repeat testing is required.

Newborn siblings of patients who have MCADD are offered diagnostic testing at 24 – 28 hours of age as well as routine testing.

Blood is taken by the community midwife from the baby's heel using a bloodletting device and collected on a bloodspot card consisting of special filter paper. It is then sent to the National Newborn Screening Laboratory in Queen Elizabeth University Hospital for analysis.

Detailed pathway is shown in **Appendix 2.1**.

2.4. Live and Stillbirths – Comparing SMR02 with National Records of Scotland

There were 11,812 live births recorded on SMR02 compared to 11,883 on National Records for Scotland during 2017/18. Table 2.1 shows these by Local Authority areas.

Table 2.1 Number of live and still births across NHSGGC by council area, 1 April 2017 to 31 March 2018

	Live births SMR02	Live births NRS	Stillbirths SMR02	Stillbirths NRS
East Renfrewshire	861	869	<5	<5
East Dunbartonshire	1,001	997	<5	<5
Glasgow City	6,607	6,650	24	37
Renfrewshire	1,770	1,777	<5	6
Inverclyde	684	688	5	5
West Dunbartonshire	889	902	<5	<5
NHSGGC	**11,812**	**11,883**	**36**	**53**

Source: http://www.isdscotland.org/Health-Topics/Maternity-and-Births/Publications/data-tables2017.asp?id=2294#2294

2.5. Delivery of NHSGGC Newborn Bloodspot Screening Programmes

Figure 2.1 illustrates newborn bloodspot uptake rates and the results of the screening programme from 1 April 2017 to 31 March 2018.

The total number of babies eligible for screening was 11,907 and of these 11,803 (98.1%) of babies were screened. Results were not available for the 59 (0.5%) babies that moved into the NHSGGC Board area and 73 (0.4%) babies that transferred out of UK on or after day seven.

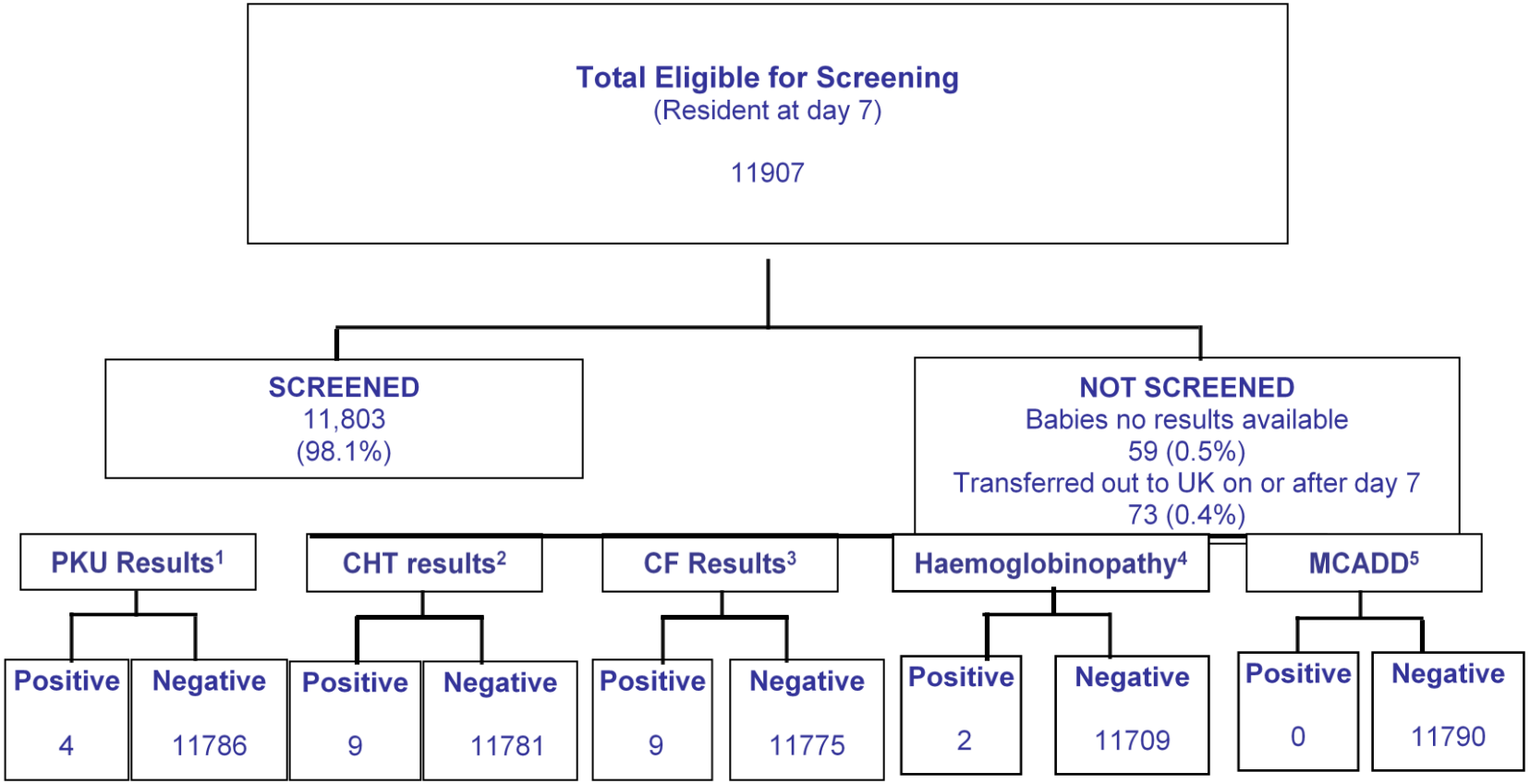
Following screening nine babies were diagnosed with congenital hypothyroidism (CHT) and less than five babies were diagnosed with PKU (phenylketonuria).

The cystic fibrosis results showed that nine babies tested positive and less than five were carriers. For Haemoglobinopathy, although less than five were diagnosed with sickle cell disease, 78 babies were identified as haemoglobinopathy carriers.

All babies received appropriate management if diagnosed with a condition and this was within the timescales of the set national standards.

In this report the phrase less than five has been used in line with NHS Scotland information governance standards to protect the privacy of individuals.

NHS Greater Glasgow & Clyde Residents
Summary of Bloodspot Screening Uptake & Results for babies born 1 April 2017 to 31 March 2018



Source: Child Health (CH2008); Date extracted: September 2018

Notes:

1 Total includes 10 repeats; 3 verifications

2 Total includes 10 repeats; 3 verifications

3 Total includes 4 carriers; 2 late; 10 repeats; 3 verifications; 2 late

4 Total includes 78 carriers; 10 repeats; 4 verifications

5 Total includes 10 repeats; 3 verifications

The percentage uptake rate of Newborn Bloodspot screening was greater than 96% across all HSCP areas and deprivation categories **(Table 2.2)**

Table 2.2 Uptake rate of Newborn Bloodspot screening by HSCP and deprivation

	Most Deprived				SIMD 2016 Quintile				Least Deprived			
	1		2		3		4		5		Total	
HSCP	No. Screened	% uptake	No. Screened	% uptake	No. Screened	% uptake	No. Screened	% uptake	No. Screened	% uptake	No. Screened	% uptake
East Dunbartonshire	54	*94.7*	171	*100.0*	39	*100.0*	178	*100.0*	552	*99.5*	994	*99.4*
East Renfrewshire	71	*100.0*	84	*98.8*	82	*97.6*	132	*99.2*	500	*99.0*	869	*99.0*
Glasgow North East	1,337	*99.2*	252	*99.6*	187	*98.9*	238	*99.2*	9	*100.0*	2,023	*99.2*
Glasgow North West	946	*99.4*	245	*99.6*	205	*100.0*	192	*99.5*	373	*99.7*	1,961	*99.5*
Glasgow South	1,266	*99.3*	506	*99.6*	420	*99.1*	288	*98.0*	165	*98.8*	2,645	*99.1*
Inverclyde	327	*99.1*	96	*100.0*	88	*100.0*	101	*100.0*	70	*98.6*	682	*99.4*
Renfrewshire	515	*99.2*	366	*98.7*	255	*98.8*	308	*96.9*	299	*98.4*	1,743	*98.5*
West Dunbartonshire	420	*99.5*	243	*97.6*	102	*99.0*	92	*98.9*	29	*100.0*	886	*98.9*
Grand Total	4,936	*99.2*	1,963	*99.2*	1,378	*99.1*	1,529	*98.6*	1,997	*99.2*	1,1803	*99.1*

Source: Child Health (CH2008); Date extracted: September 2018

2.6. Ethnicity of babies born in 2017/18

The breakdown of the ethnicity groups for babies tested within NHSGGC shows that 9,182 (75.2%) of babies screened were All White UK, 926 (7.6%) South Asian and 605 (5.0%) were of Southern and Other European ethnic groups **(Table 2.3).**

Table 2.3 NHSGGC Newborn Bloodspot screening – ethnicity of the babies tested 1 April 2017– 31 March 2018

	Clyde		Glasgow		Total	
Ethnicity Group	**N**	**%**	**N**	**%**	**N**	**%**
African or African Caribbean (Black)	17	0.5	330	3.7	347	2.8
South Asian (Asian)	70	2.2	856	9.5	926	7.6
South East Asian (Asian)	16	0.5	166	1.8	182	1.5
Other non-European (Other)	17	0.5	232	2.6	249	2.0
Southern & Other European (White)	107	3.3	498	5.5	605	5.0
United Kingdom (White)	2,677	83.2	5,779	64.3	8,456	69.2
North Europe (White)	26	0.8	95	1.1	121	1.0
Don't Know / Decline to Answer	0	0	0	0	0	0
Any Mixed Background	127	3.9	519	5.8	646	5.3
Not Stated	160	5.0	513	5.7	673	5.5
Total	**3,217**		**8,988**		**12,205**	

Source: Scottish Newborn Screening Laboratory - Newborn Bloodspot Screening Report 2017/18

Note: Scottish Newborn Screening Laboratory figures cannot be mapped to NHS GGC new boundary and may include Lanarkshire, Highland patients, etc

2.7. Ethnicity of Babies 2012/13 to 2017/18

Across NHSGGC the changes in population and migration from other countries is illustrated when data is compared for ethnicity recorded on the Newborn Bloodspot card. Comparing the percentages for the ethnic groups in 2012/13 to those recorded in 2017/18 showed:

For African and African Caribbean residents the percentage has decreased from 0.8% in Clyde to 0.5% but increased from 3.4% to 3.7% for Glasgow. For the South Asian community there is a slight decrease from 2.3% to 2.2% in Clyde but an increase from 8.2% to 9.5% for Glasgow.

For the South East Asian community there was a slight increase from 0.4% to 0.5% in Clyde and a decrease from 2.7% to 1.8% in Glasgow. Other non-Europeans had an increase from 0.2% to 0.5% for Clyde and doubled from 1.3% to 2.6% in Glasgow for 2017/18 **(Table 2.4).**

Table 2.4 NHSGGC Newborn Bloodspot screening – ethnicity of the babies tested 1 April 2011 – 31 March 2017

	2012/13		2013/14		2014/15		2015/16		2016/17		2017/18	
	Glasgow	Clyde	Glasgow	Clyde	Glasgow	Clyde	Glasgow	Clyde	Glasgow	Clyde	Glasgow	Clyde
African or African Caribbean (Black)	3.4%	0.8%	3.2%	1.1%	2.7%	1.2%	3.2%	0.7%	3.5%	0.8%	3.7%	0.5%
South Asian (Asian)	8.2%	2.3%	8.6%	1.7%	8.6%	1.6%	8.9%	1.9%	9.1%	2.4%	9.5%	2.2%
South East Asian (Asian)	2.7%	0.4%	2.5%	0.6%	2.6%	0.5%	2.3%	0.5%	2.3%	0.5%	1.8%	0.5%
Other non-European	1.3%	0.2%	1.4%	0.2%	1.5%	0.2%	1.4%	0.2%	2.3%	0.2%	2.6%	0.5%

Source: Scottish Newborn Screening Laboratory data from 2012/13 to 2017/18

2.8. Specimen Tests and Outcomes for 2017/18

The laboratory outcomes of Newborn Bloodspot tests shows that in 2017/18, of the 12,798 bloodspot samples received, 12,679 test results were normal. There are several tests carried out on each specimen **(Table 2.5).**

149 (1.16%) specimens could not be analysed due to insufficient amounts of blood on the bloodspot card and required a repeat test. Avoidable repeat samples can cause anxiety for parents, distress to babies and delays in the screening process.

Two samples received had taken more than 14 days to arrive at the laboratory. National standards require that 95% of positive cases of congenital hypothyroidism and phenylketonuria start treatment by 14 days of age and for cystic fibrosis by 35 days of age. Therefore, the time from when a test is taken to the time of arrival at the laboratory is important.

Table 2.5 Specimen test outcomes for NHSGGC for period 1 April 2017 and 31 March 2018

Specimen Test - Outcomes	Clyde	Glasgow	Total
Refused all tests	2	6	**8**
Partial refused	0	0	**0**
Insufficient blood to perform all tests	35	114	**149**
Unsatisfactory >14 days in transit	0	2	**2**
Unsatisfactory No CHI	21	104	**125**
Unsatisfactory Other	9	35	**44**
<3 days post T/F	3	6	**9**
Updated info	112	441	**553**
IRT tested late (total)	22	155	**177**
IRT tested late (Born in Scotland)	1	3	**4**
Ref PKU	0	<5	**<5**
Ref CHT	0	10	**10**
Ref CF	5	6	**11**
Ref CF Carrier	<5	<5	**<5**
Ref MCADD	0	0	**0**
Ref MSUD*	0	0	**0**
Ref HCU*	<5	0	**<5**
Ref IVA*	0	<5	**<5**
Ref GA1*	0	0	**0**
Ref SCD	0	<5	**<5**
Ref SCD Carrier	5	62	**67**
Ref HbV	0	0	**0**
Ref HbV Carrier	<5	17	**<20**
Number of normal results	3,335	9,344	**12,679**
Pre-TF	14	52	**66**
Sent for SCD DNA	4	13	**17**
Total Specimens received	**3,349**	**9,449**	**12,798**

*screening for these conditions started 20th March 2017

Insufficient as % of Total	1.1	1.3	1.16
Unsatisfactory as % of Total	0.25	0.3	0.55
IRT tested late as % of Total	0.66	1.63	1.38
IRT tested last (born in Scotland) as % of Total	0.03	0.03	0.03

Source: Scottish Newborn Screening Laboratory - Newborn Bloodspot Screening Report 2017/18

Notes

Scottish Newborn Screening Laboratory figures cannot be mapped to NHS GGC new boundary and may include Lanarkshire, Highland patients, etc

Parental decline - parents have the option to decline tests for some or all of the conditions screened

Unsatisfactory = specimen damaged or of poor quality

Updated Information = cards that were received with incorrect or missing details

Results are not issued until the relevant information is received

IRT Tested Late = baby was more than 6 weeks of age when specimen was taken. The test for Cystic Fibrosis is not reliable after 6 weeks.

Ref PKU = babies with high or persistently raised levels of phenylalanine that were referred to paediatricians for further investigations. Some of these may not be confirmed cases of PKU.

Ref CHT = babies with high or persistently raised levels of TSH that were referred to paediatricians for further investigations. Some of these may not be confirmed cases of Congenital Hypothyroidism.

Ref CF = babies suspected of having Cystic Fibrosis of babies referred for Sweat testing. Some of these cases may not be confirmed as cases of CF.

Ref Carrier CF = babies referred as possible carriers of Cystic Fibrosis

Ref MCADD = babies with suspected MCADD referred to paediatricians for further investigations

Ref SCD = babies referred to haematologists with suspected Sickle Cell Disorder

Ref SCD Carrier = babies referred as suspected carriers of Sickle Cell Disorder.

Ref HbV = babies referred to haematologists suspected of having a haemoglobinopathy disorder. These require follow-up for confirmation and some may not be confirmed as cases.

Ref HbV Carrier = babies referred as suspected carriers of a haemoglobinopathy disorder. Some of these have unidentified variants and may required follow-up for confirmation.

2.9. Information systems

Pregnancy and Newborn Bloodspot screening tests results are provided by the National Laboratory's Information Management System and data are reported on the old former NHS Greater Glasgow and NHS Argyll and Clyde basis.

The results of the Bloodspot test are recorded against the individual child's record held within the Scottish Immunisation and Recall System (SIRS) and also in PNBS IT application that supports the failsafe processes for newborn bloodspot screening.

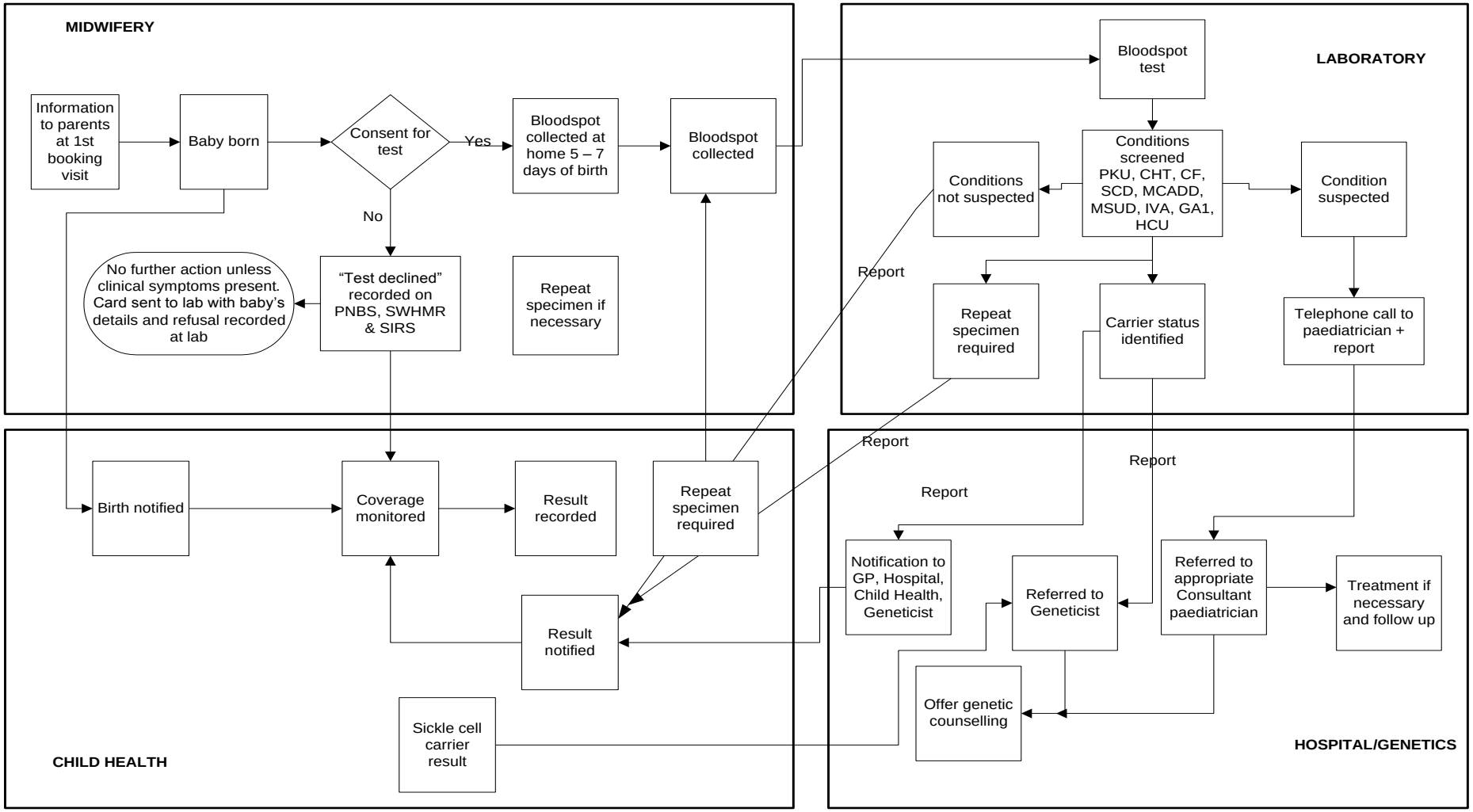
2.10. Challenges and Service Improvements

- Support parents whose children are identified as carriers of Sickle Cell Disease to access genetic counselling.

- Develop a website with information about haemoglobinopathies for staff and parents in accessible formats.

NHSGGC Newborn Bloodspot Screening Pathway

Appendix 2.1



Appendix 2.2

Members of Newborn Bloodspot Screening Steering Group
As at March 2017

Dr Emilia Crighton	Head of Health Services Section (Chair)
Ms Sally Amor	Health of Health Improvement, NHS Highland
Mr Paul Burton	Information Manager
Mrs Lin Calderwood	HI&T Service Delivery Manager
Dr Elizabeth Chalmers	Consultant Paediatric Haematologist
Mrs Diana Clark	Lead Midwife
Ms Barbara Cochrane	Metabolic Dietician
Ms Alison Cozens	Consultant in Inherited Metabolic Medicine
Dr Rosemarie Davidson	Consultant Clinical Geneticist
Dr Anne Devenny	Consultant Paediatrician
Ms Alison Estell	Healthcare Scientist
Mrs Elaine Garman	Public Health Specialist, NHS Highland
Mr Ian Fergus	Technical Site Manager
Ms Dorothy Finlay	Lead Midwife
Ms Patricia Friel	Lead Nurse
Dr Peter Galloway	Consultant Clinical Biochemist
Mrs Jaki Lambert	Lead Midwife
Miss Denise Lyden	Project Officer
Dr Helen Mactier	Consultant Neonatologist
Ms Karen McAlpine	Lead Midwife
Mrs Marie-Elaine McClair	Clinical Service Manager, Community Midwifery
Ms Julie Mullin	Assistant Programme Manager
Mrs Uzma Rehman	Programme Manager, Public Health
Ms Elizabeth Rennie	Programme Manager
Ms Sarah Smith	Principle Scientist, Newborn Screening Laboratory
Ms Margaretha van Mourik	Consultant Genetics Counsellor
Mrs Nicola Williamson	Consultant Clinical Scientist

Chapter 3 - Universal Newborn Hearing Screening

Summary

Universal Newborn Hearing screening can detect early permanent congenital hearing impairment in babies as well mild and unilateral losses.

Of the 11,874 eligible babies, 11,678 (98.3%) were screened for hearing loss. A second stage follow up was required for 1,222 (10.5%) babies and of these, 183 (1.6%) were referred to audiology.

45 babies were confirmed with a hearing loss (0.3% of the screened population). 20 babies had confirmed bilateral hearing loss and 25 babies had confirmed unilateral hearing loss.

196 (1.65%) babies did not complete the screening programme. These included babies who did not attend for screening (130), are deceased (37) or have moved away (4) from their current home address or transferred to another Board area.

Chapter Contents

3.1. Universal Newborn Hearing Screening

Universal Newborn Hearing screening aims to detect early permanent congenital hearing impairment. In addition, babies with mild and unilateral losses are also being identified and receive ongoing review.

3.2. Eligible Population

Universal Newborn Hearing screening programme is offered to all newborns by 4 weeks of corrected age (NICU) babies or by 5 weeks corrected age (community programmes). The eligible babies are those whose mothers were registered with a GP practice within the Health Board or resident within the area.

The babies excluded are those who died before screening was complete or have not reached the corrected age for screening.

3.3. Screening Tests

Hearing tests are carried out on all babies born in NHS Greater Glasgow and Clyde using the Automated Auditory Brainstem Response (AABR). The screening is completed prior to discharge from hospital if this is not possible then an appointment is made at an outpatient clinic.

3.4. Repeat Screens

These may be required if the baby was unsettled during the original screen, or if there was fluid or temporary blockage in the ear and for confirmation if the baby has a hearing loss.

Detailed screening pathway is shown in **Appendix 3.1**

3.5. Delivery of NHSGGC Universal Newborn Hearing Screening Programme

The uptake of Newborn Hearing Screening is high across all areas and ranged from 97.7% in Glasgow South to 99.5% in East Dunbartonshire **(Table 3.1).**

Table 3.1 Percentage Uptake for newborn hearing screening by HSCP

HSCP	Not Screened	Screened	Total	% Uptake
East Dunbartonshire	5	984	989	*99.5*
East Renfrewshire	5	852	857	*99.4*
Glasgow North East	45	1982	2027	*97.8*
Glasgow North West	40	1939	1979	*98.0*
Glasgow South	61	2616	2677	*97.7*
Inverclyde	10	677	687	*98.5*
Renfrewshire	14	1753	1767	*99.2*
West Dunbartonshire	16	875	891	*98.2*
Total	196	11678	11874	*98.3*

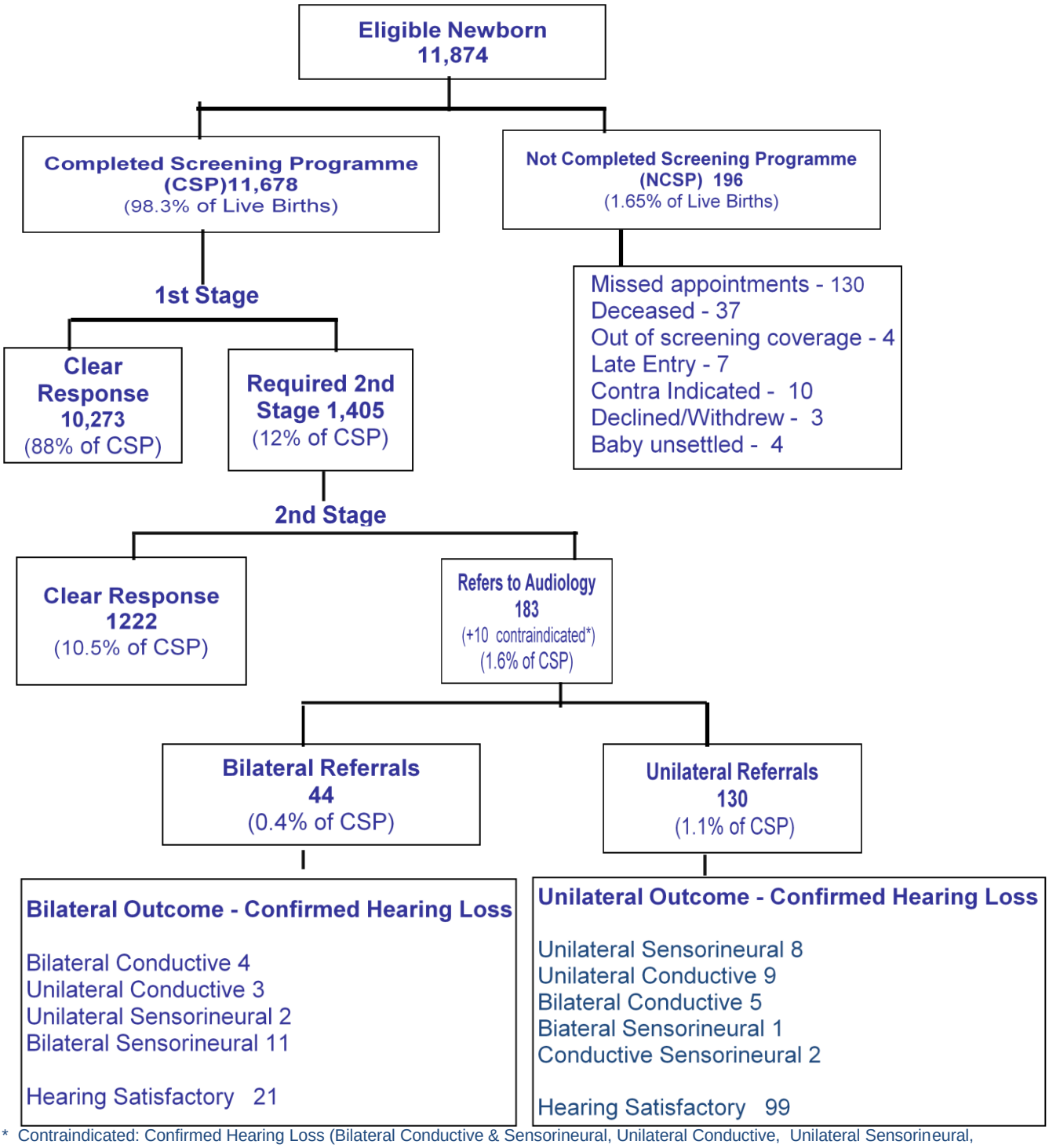
Source: Scottish Birth Record (SBR) Extracted: September 2018

Of the 11,874 eligible babies, 11,678 were screened for hearing loss giving an uptake of 98.3%.

1,222 (10.5%) babies required a second stage follow up and, of these, 183 (1.6%) babies were referred to audiology. Forty-five babies were confirmed with a hearing loss (0.3% of the screened population). Twenty babies had confirmed bilateral hearing loss and 25 babies had confirmed unilateral hearing loss.

196 (1.65%) babies did not complete the screening programme. These included babies who did not attend for screening (130), are deceased (37) or have moved away (4) from their current home address or transferred to another Board area **(Figure 3.1).**

Figure 3.1 Summary of NHSGGC Residents Universal Newborn Hearing Screening activity for period 1 April 2017 to 31 March 2018



* Contraindicated: Confirmed Hearing Loss (Bilateral Conductive & Sensorineural, Unilateral Conductive, Unilateral Sensorineural, Bilateral Sensorineural)

Definitions - Screening

1st Stage - 1st Screen (AABR1) for Greater Glasgow & Clyde

2nd Stage - 2nd screen (AABR2) for Greater Glasgow & Clyde

Not Completed screening programme- all babies did not completed screen process but have a final outcome set on SBR includes, DNA, Deceased, Moved Away, etc. Babies who are still in screen process either awaiting 1st or 2nd stage screen are also in this data

Definitions - Outcomes

Hearing Under assessment: all babies who have referred from the screen but have not attended for diagnostic testing at time report was compiled.

Incomplete: Patient did not attend appointment for diagnostic testing

Not yet determined: the severity and type of loss is not finalised at the time of reporting. Will be followed up in Audiology.

PCHI: all babies who were diagnosed with permanent Childhood Hearing Loss in both ears - better ear responses at 40dB and more.

Source: Scottish Birth Record (SBR); Extracted September 2018

3.6. Information Systems

The Universal Newborn Hearing Screening programme is supported by the Scottish Birth Record (SBR) to deliver hearing screening.

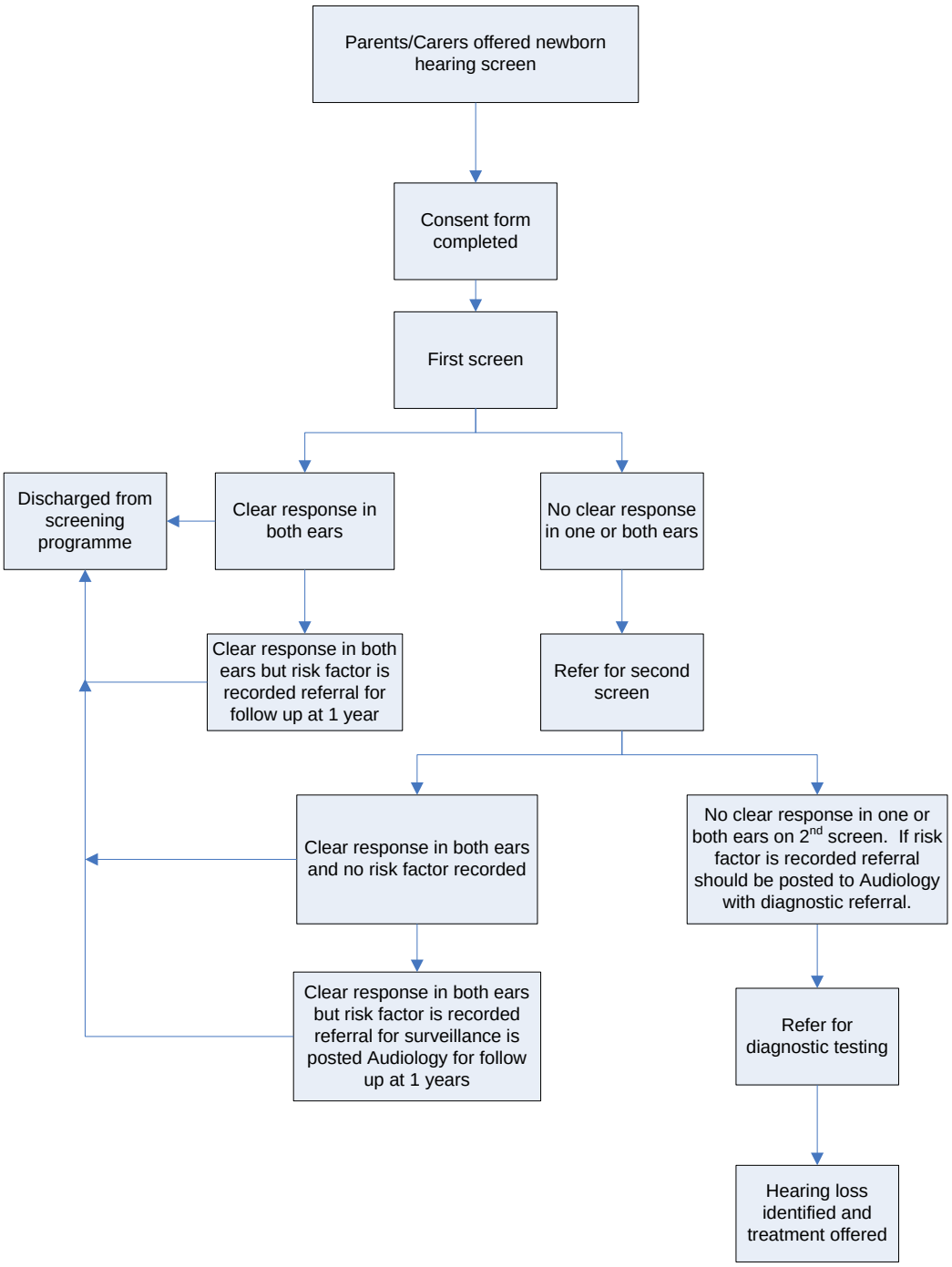
The Child Health Surveillance Programme Pre-School system (CHSP-PS) holds screening outcomes and is used as a failsafe to ensure all babies are offered hearing screening.

3.7. Challenges and Future Priorities

- Maintain service performance and ensure that all babies are offered Universal Newborn Hearing Screening to meet national standards and targets.
- Replace old testing equipment across all sites.

Appendix 3.1

NHSGGC Universal Newborn Hearing Screening Pathway



Appendix 3.2

Universal Newborn Hearing Screening Programme Steering Group

Dr Emilia Crighton	Head of Health Services Section (Chair)
Mrs Karen Boyle	Newborn Hearing Screening Manager
Mr Paul Burton	Information Manager
Ms Isobel Cook	Midwife/Screener, Argyll and Bute
Ms Mary Fingland	LMC Representative
Mrs Dorothy Finlay	Lead Midwife
Mr Dougie Fraser	Service Manager
Dr Ruth Hamilton	Clinical Scientist
Mr James Harrigan	Head of Audiology
Ms Fiona Jarvis	Specialist Speech and Language Therapist
Ms Karen McAlpine	Lead Midwife
Dr Juan Mora	Consultant Audiological Physician
Mrs Julie Mullin	Assistant Programme Manager, Screening Dept
Dr Andrew Powls	Consultant Neonatologist
Mrs Uzma Rehman	Public Health Programme Manager
Ms Patricia Renfrew	Consultant Practitioner, Argyll and Bute
Ms Vivien Thorpe	Clinical Scientist

Chapter 4 - Child Vision Screening

Summary

Pre-school Vision Screening Programme

Vision Screening is routinely offered to all pre-school age children resident in NHS Greater Glasgow and Clyde areas. Vision problems affect 3-6% of children and although obvious squints are easily detected, refractive error and subtle squints often go undetected and long-term vision loss in adulthood can develop. Most problems can be treated using spectacle lenses to correct any refractive error and occlusion therapy to treat strabismus (squint) – mainly using eye patches.

In 2017/18, 12,642 children aged between four to five years old were identified using the Community Health Index System as being eligible for pre-school vision screening.

Overall uptake was 86.8% (10,977). Highest uptake was in Inverclyde 94.7% (715) and the lowest in Glasgow North West 79.8% (1,560). Highest uptake was among children of Chinese ethnicity 93.0% (212), followed by White British children 89.1% (7141). Lowest uptake was among children unclassified by ethnic group 70.9% (175)

Of the 10,977 children screened, 7,464 (68.0%) had a normal result, this ranged from 76.1% (862) in East Renfrewshire to 58.7% (958) in Glasgow North East.

Of the 2,656 (24.2%) children referred for further assessment, 1,261 (28.7%) were from the most deprived area. The highest proportion of children screened that were referred for further investigation was in Glasgow North East 31.9% (521) and Glasgow South 27.9% (619). The lowest was 16.5% (290) in Renfrewshire.

670 (6.1%) children were already attending an eye clinic service ranging from 4.8% (54) in East Renfrewshire to 7.0% (59) in West Dunbartonshire.

Primary 7 School Vision Screening Programme

In 2017/18, 11,807 Primary 7 school children were eligible for a vision test and 8,785 (74.4%) were tested. Highest uptake was in Inverclyde 92.9% (775) and the lowest uptake in East Dunbartonshire 7.9% (94). The uptake was highest among children living in the least deprived areas (90.3%) compared to 83.9% among children living in the most deprived areas. Highest uptake was among children of Black or Black British origin 87.7% (136) and the lowest uptake 56.1% (110) among children in the unclassified group.

Of the 11,807 children eligible for vision testing, 1,586 (13.4%) were already wearing prescription spectacles. The highest percentage wearing glasses was in Inverclyde (17.4%) and the lowest in Renfrewshire (11.4%). (East Dunbartonshire's figures are low due to lack of vision screening in the locality). 1527 (21.2%) were identified with poor visual acuity. The highest proportion of children identified with poor acuity lived in Glasgow South 32.5% (530) and the lowest in Inverclyde 9.3% (59).

Chapter Contents

Pre-school Vision Screening Programme

4.1. Background

Vision Screening is routinely offered to all pre-school age children resident in NHS Greater Glasgow and Clyde areas.

Amblopia can be caused by either a squint (strabismus) or differences in the focusing power of each eye (refractive error) which results in the brain receiving different images from each eye. If these problems are not treated early in childhood, this can lead to reduced vision in one or, in some cases, both eyes. The screening programme can also detect reduced vision due to other more uncommon causes.

Vision problems affect 3-6% of children and although obvious squints are easily detected, refractive error and subtle squints often go undetected and long-term vision loss in adulthood can develop. Most problems can be treated using spectacle lenses to correct any refractive error and occlusion therapy to treat strabismus (squint) – mainly using eye patches. These treatments can be used alone or in combination. Treatment is most effective when the brain is still developing (in young children) and when the child co-operates in wearing the patch and/or glasses.

The most common cause of poor vision is refractive error.

4.2. Aim of Vision Screening Programmes

The aim of the screening programme is to detect reduced visual acuity, the commonest causes of which are amblyopia and refractive error. There is emerging evidence that good screening and treatment result in lower incidence of significant permanent vision loss.

4.3. Pre- school vision test

The basic screen is a visual acuity test where children are asked to match a line of letters or pictures to a key card or to describe a line of pictures.

4.4. Eligible Population

All children resident in NHS Greater Glasgow and Clyde aged between four and five years are invited to attend screening for reduced vision.

4.5. Pre-school Vision Screening Pathway

The list of eligible children (the school intake cohort for the following year), with dates of birth between 1 March 2013 and 28 February 2014 were downloaded from CHI and matched against the lists received from nurseries.

Pre-school vision screening clinics take place in the nursery setting. Children that do not attend nursery or school or whose nursery is unknown or miss their appointment

within the nursery are invited to a hospital Orthoptic clinic to have their vision screened.

A proportion of children require further testing in secondary care following the initial screen. These children are referred for further assessment to a paediatric clinic in an ophthalmology department, though a small number may be referred to a community optometrist. The assessment appointment involves a full eye examination and allows operators to identify whether the screen test was a false positive and no further action is required or if the screen test was a true positive to enable the specific disorder to be identified and treated.

4.6. Delivery of Pre-school Vision Screening Programme 2017/18

In 2017/18, 12,642 children aged between four to five years old were identified using the Community Health Index System as being eligible for pre-school vision screening.

5,231 (41.4%) of all pre-school children within NHSGGC live in the most deprived quintile. The majority of these children are resident within the Glasgow City sectors 3698 (70.5%) **(Table 4.1)**

Table 4.1 Number of Eligible NHSGGC Child Residents by HSCP Area and by Deprivation Categories

	SIMD Quintile 2016					
	Most deprived				Least deprived	
HSCP	**1**	**2**	**3**	**4**	**5**	**Total**
East Dunbartonshire	77	193	62	205	689	1,226
East Renfrewshire	75	108	113	173	770	1,239
Glasgow North East	1,349	215	187	209	8	1,968
Glasgow North West	1,036	218	205	165	331	1,955
Glasgow South	1,304	589	398	204	166	2,661
Inverclyde	375	99	93	98	90	755
Renfrewshire	569	369	308	290	351	1,889
West Dunbartonshire	446	272	106	87	40	951
Total	5,231	2,063	1,472	1,431	2,445	12,642
% of Total	**41.4**	**16.3**	**11.6**	**11.3**	**19.3**	

Source: Child Health - Pre-School Date Extracted: September 2018

Not all children eligible for vision screening are registered with a nursery. Those that miss screening in nursery are sent an appointment for a hospital clinic. West Dunbartonshire has the highest proportion of children registered with a nursery 95.6% (909) and North East Glasgow the lowest, 85.0% (1673) **(Table 4.2)**

Table 4.2 Number of NHSGGC children eligible for screening, number and percentage registered with a nursery by HSCP

HSCP	Children eligible for screening	Registered with a Nursery	% Registered	Not registered with a nursery	% Not Registered
East Dunbartonshire	1,226	1,157	94.4	69	5.6
East Renfrewshire	1,239	1,168	94.3	71	5.7
Glasgow North East	1,968	1,673	85.0	295	15.0
Glasgow North West	1,955	1,667	85.3	288	14.7
Glasgow South	2,661	2,300	86.4	361	13.6
Inverclyde	755	710	94.0	45	6.0
Renfrewshire	1,887	1,787	94.7	100	5.3
West Dunbartonshire	951	909	95.6	42	4.4
Total	12,644	11,372	89.9	1,272	10.1

Source: Child Health – Pre-school Date Extracted: September 2018

Using the Onomap software, the number and percentage of children screened by ethnicity was analysed. The highest uptake was among children of Chinese ethnicity at 93% (212), followed by White British ethnicity where uptake was 89.1% (7141). The lowest uptake was among the unclassified group at 70.9% (175) **(Table 4.3).**

Table 4.3 Pre-school Vision Screening Uptake by Ethnicity

2001 Census Ethnic Group	Not Screened	Screened	Total	*% Screened*
White - British	872	7,141	8,013	*89.1*
White - Irish	195	1,363	1,558	*87.5*
White - any other white background	204	698	902	*77.4*
Asian or Asian British - Indian	39	226	265	*85.3*
Asian or Asian British - Pakistani	103	504	607	*83.0*
Asian or Asian British - Bangladeshi	14	48	62	*77.4*
Asian or Asian British - Other Asian Background	2	10	12	*83.3*
Black or Black British - Caribbean	1	3	4	*75.0*
Black or Black British - African	32	183	215	*85.1*
Other ethnic groups - Chinese	17	212	229	*93.0*
Other ethnic groups - any other ethnic group	115	413	528	*78.2*
Unclassified	72	175	247	*70.9*
Total	**1,665**	**10,977**	**12,642**	***86.8***

Source Child - Pre School Onomap Software – September 2018

10977 (86.8%) children were screened in 2017/18 representing a decrease of 0.4% from previous year. The highest uptake was in Inverclyde HSCP 94.7% (715) and the lowest in Glasgow North West 79.8% (1560).

68% (7464) children screened had a normal result, this ranged from 76.1% (862) in East Renfrewshire to 58.7% (958) in Glasgow North East.

Overall 24.2% (2,656) children screened were referred for further investigations. The referral rates varied from 16.5% (290) in Renfrewshire to 31.9% (521) in Glasgow North East.

The percentage of children screened that were already attending an eye clinic was 6.1% (670), ranging from 4.8% (54) in East Renfrewshire to 7.0% (59) in West Dunbartonshire **(Table 4.4).**

Table 4.4 Pre-school Vision Screening Uptake and Outcomes by HSCP Area 2017 to 2018

HSCP	Total Population	Total number of children screened	Total number of children not screened	% Uptake	% No Abnormality Detected (NAD) of those screened	% Referred of those screened	% Recalled of those screened	% Already attending eye clinic
East Dunbartonshire	1,226	1,111	115	*90.6*	*71.9*	*22.2*	*1.0*	*4.9*
East Renfrewshire	1,239	1,133	106	*91.4*	*76.1*	*18.6*	*0.5*	*4.8*
Glasgow North East	1,968	1,633	335	*83.0*	*58.7*	*31.9*	*2.9*	*6.6*
Glasgow North West	1,965	1,560	395	*79.8*	*65.9*	*27.0*	*1.3*	*5.8*
Glasgow South	2,661	2,220	441	*83.4*	*63.9*	*27.9*	*1.3*	*6.9*
Inverclyde	755	715	40	*94.7*	*72.0*	*20.7*	*1.8*	*5.5*
Renfrewshire	1,887	1,761	126	*93.3*	*74.4*	*16.5*	*2.8*	*6.4*
West Dunbartonshire	951	844	107	*88.7*	*68.0*	*23.9*	*1.1*	*7.0*
Total	**12,642**	**10,977**	**1,665**	***86.8***	***68.0***	***24.2***	***1.7***	***6.1***

Source: Child Health - Pre-School Date Extracted: September 2018

The uptake was highest among children living in the least deprived areas (90.3%) compared to 83.9% among children living in the most deprived areas.

A significantly larger proportion of children living in the most deprived areas were referred for further assessment, recalled or required ongoing follow up. Of the 2,659 children referred for further assessment, 1,261 were from the most deprived area.

184 (1.7%) children were recalled back to be screened due to difficulties screening their vision during the first screen. The proportion of children with a normal result ranged from 61.5% (2701) among children living in the most deprived area to 77.5% (1711) in the least deprived area. Referrals were also higher for children from the most deprived areas 28.7% (1261) compared to 17.5% (387) in the least deprived areas.

Of the 669 (6.1%) children already attending an eye clinic, 324 are from the most deprived area **(Table 4.5).**

Table 4.5 Pre-school Vision Screening Uptake and Outcomes by SIMD 2017 to 2018

SIMD	No. of Eligible Children	No. of Children Screened	% Uptake	No Abnormality Detected (NAD)	*% NAD*	Referred	*% Referred*	Recall	*% Recall*	Already attending eye clinic	*% Already attending eye clinic*
1 (Most Deprived)	5,231	4,390	83.92%	2,701	*61.5*	1,261	*28.7*	104	*2.4*	324	*7.4*
2	2,063	1,786	86.57%	1,218	*68.2*	445	*24.9*	18	*1.0*	105	*5.9*
3	1,472	1,303	88.52%	905	*69.5*	297	*22.8*	17	*1.3*	84	*6.4*
4	1,431	1,290	90.15%	930	*72.1*	269	*20.9*	23	*1.8*	68	*5.3*
5 (Least Deprived)	2,445	2,208	90.31%	1,711	*77.5*	387	*17.5*	22	*1.0*	88	*4.0*
Total	12,642	10,977	86.83%	7,465	*68.0*	2,659	*24.2*	184	*1.7*	669	*6.1*

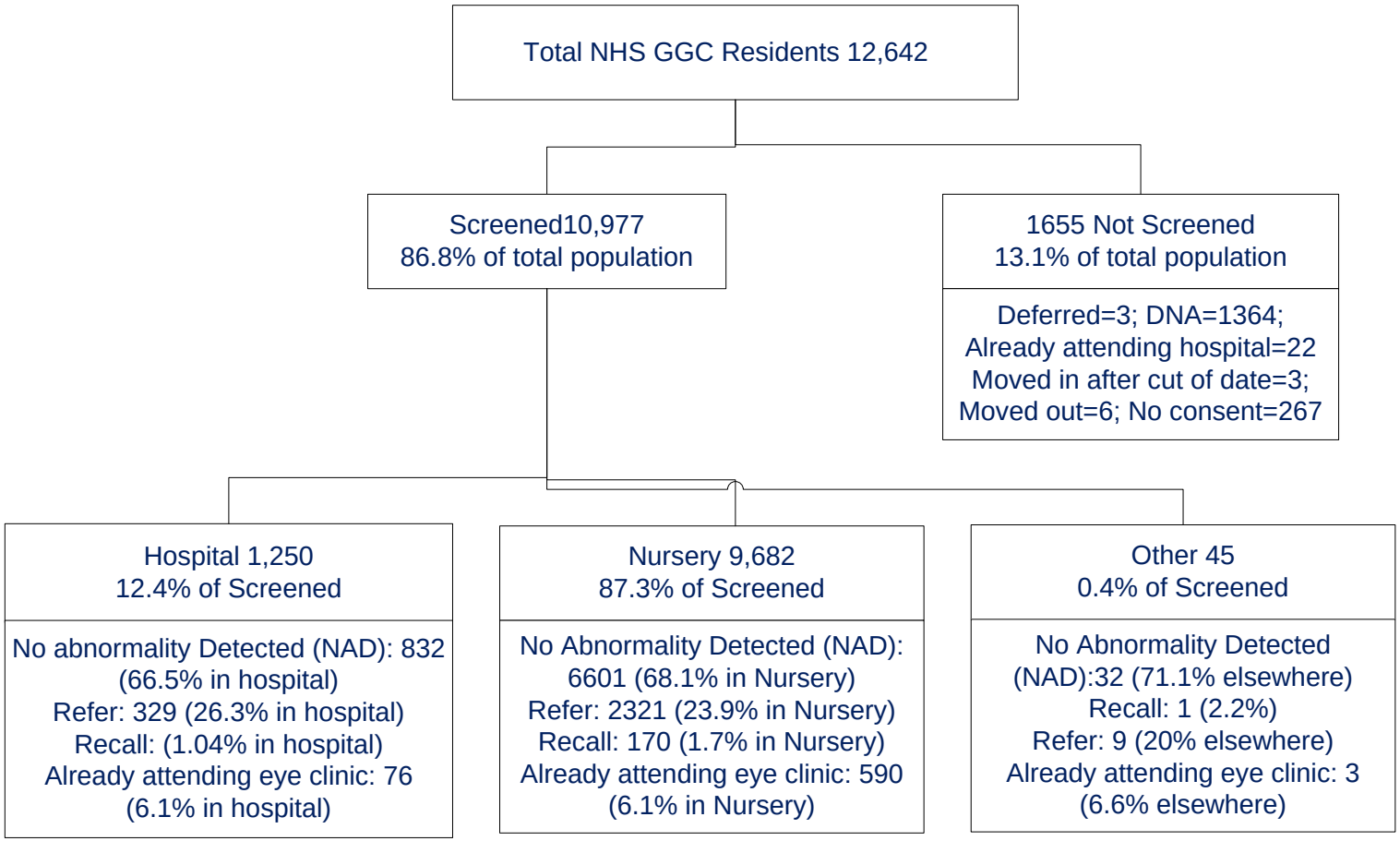
Source: Child Health - Pre-School Date Extracted: September 2018

The Pre- school vision screening summary of activity for the service in NHS Greater Glasgow and Clyde for the school year 2017-2018 is in **Figure 4.1.**

10,977 children were screened in Nurseries and 6,601 (68.0%) had a normal result, 2,321 (23.9%) were referred and 590 (6.1%) had ongoing follow up by Ophthalmology services.

Those not screened in nursery were invited to attend the hospital based service. 1250 (12.4%) children were screened within a hospital setting, 832 (66.5%) had a normal result, 329 (26.3%) were referred and 76 (6.1%) were already attending an eye clinic.

Figure 4.1 Summary of NHSGGC Pre-School Vision Screening Activity



Source: Child-Health-Pre-School
Data extracted: September 2018

4.7. P7 Eligible Population

All school children in Primary 7 resident in NHSGGC are offered a vision test prior to transfer to secondary education.

4.8. P7 Vision Test

A visual acuity test is carried out where children are asked to identify a line of letters using a Snellen chart or Logmar if a child is unable to manage a Snellen chart. Testing is also carried out on children who already have glasses.

4.9. P7 Vision Screening Pathway

P7 vision screening takes place in school and is carried out by a School Support Worker. Children that do not attend school or miss their appointment within the school are advised to attend their local community optometrist.

Parents/carers are issued with result letter.

The referral pathway for those with abnormal results is to the local community optometrist:

- Parent/carer is given a referral letter to take to their local community optometrist for further examination if a child's visual acuity without glasses is 6/9 or poorer in one or both eyes or with glasses is 6/12 or poorer in the better eye.

- Children who have specific visual abnormalities leading to visual impairment, if not already known are also referred to a community paediatrician.

- If a child has a sudden onset squint, the School Nurse, GP and parent will be informed on the same day as this can be associated with more serious illness which needs urgent assessment and management.

4.10. Delivery of Primary 7 School Vision Screening Programme 2017 to 2018

In 2017/18, 11,807 Primary 7 school children were eligible for a vision test of which 8785 (74.4%) were tested. The highest delivery was in Inverclyde 92.9% (775) and the lowest was in East Dunbartonshire at 7.9% (94). This was due to East Dunbartonshire not providing P7 screening during the school nurses review **(Table 4.6).**

Table 4.6 NHSGGC mainstream schools primary 7 vision screening Upatake by HSCP, 2017 to 2018

HSCP (School)	Not Screened	Screened	Total	% Uptake
East Dunbartonshire	1,094	94	1,188	*7.9*
East Renfrewshire	122	1,115	1,237	*90.1*
Glasgow North East Sector	234	1,417	1,651	*85.8*
Glasgow North West Sector	361	1,318	1,679	*78.5*
Glasgow South Sector	323	2,024	2,347	*86.2*
Inverclyde	59	775	834	*92.9*
Renfrewshire	655	1,209	1,864	*64.9*
West Dunbartonshire	174	833	1,007	*82.7*
Total	**3,022**	**8,785**	**11,807**	***74.4***

Source: CHSP_PS, November 2018

Analysis of the number and percentage of children screened by ethnicity shows that the highest uptake was among children of Black or Black British children at 87.7% (136) and the lowest uptake was among those unclassified by ethnic group 56.1%(110) **(Table 4.7).**

Table 4.7 NHSGGC Primary 7 Screening Uptake by ethnicity, 2017 to 2018

2001 Census Ethnic Group	Not Screened	Screened	Total	% Screened
White - British	2,083	6,059	8,142	*74.4*
White - Irish	374	1,155	1,529	*75.5*
White - any other white background	142	385	527	*73.1*
Asian or Asian British - Indian	52	132	184	*71.7*
Asian or Asian British - Pakistani	117	389	506	*76.9*
Asian or Asian British - Bangladeshi	10	24	34	*70.6*
Asian or Asian British - Any Other Asian Background	2	9	11	*81.8*
Black or Black British - Caribbean	1	5	6	*83.3*
Black or Black British - African	19	136	155	*87.7*
Other ethnic groups - Chinese	36	86	122	*70.5*
Other ethnic groups - any other ethnic group	100	295	395	*74.7*
Unclassified	86	110	196	*56.1*
Total	**3,022**	**8,785**	**11,807**	***74.4***

Source: CHSP_PS, Onomap, November 2018

Of the 11,807 children eligible for vision testing, 13.4% (1586) were already wearing prescription spectacles. The highest percentage wearing glasses was in Inverclyde (17.4%) and the lowest in Renfrewshire (11.4%). (East Dunbartonshire's figures are low due to lack of vision screening in the locality) **(Table 4.8).**

Table 4.8 NHSGGC mainstream schools primary 7 vision screened pupils 2017-18: wearing spectacles

HSCP	No Spectacles	Spectacles	Total	% Spectacles
East Dunbartonshire	1,174	14	1,188	*1.2*
East Renfrewshire	1,038	199	1,237	*16.1*
Glasgow North East Sector	1,391	260	1,651	*15.7*
Glasgow North West Sector	1,450	229	1,679	*13.6*
Glasgow South Sector	1,954	393	2,347	*16.7*
Inverclyde	689	145	834	*17.4*
Renfrewshire	1,651	213	1,864	*11.4*
West Dunbartonshire	874	133	1,007	*13.2*
Total	**10,221**	**1,586**	**11,807**	***13.4***

Source: CHSP_PS, November 2018

Of the 11,807 children, 61.0% (7,199) were screened using a Snellen test(78.8%) and 5,672 recorded with Acuity of 6/6 which is normal. A follow up with an Optometrist is recommended for children with an Acuity worse than 6/9 (if not wearing spectacles) and Acuity of 6/12 or worse (for those with spectacles). The highest proportion of children identified with poor acuity (6/9 and 6/12 combined) lived in Glasgow North East sector 25.6% (296) and the lowest in Inverclyde 9.3% (59) **(Table 4.9).**

Table 4.9: NHSGGC residents primary 7 vision screened pupils 2017 to 2018 identified with poor acuity

HSCP (School)	Total	Snellen Test	% Snellen Test	Acuity 6/6	% Acuity 6/6	Acuity 6/9	% Acuity 6/9	Acuity 6/12 or worse	% Acuity 6/12 or worse	% Acuity 6/9 and 6/12 combined
East Dunbartonshire	1,188	80	*6.7*	67	*83.8*	9	*11.3*	4	*5.0*	*16.3*
East Renfrewshire	1,237	916	*74.1*	701	*76.5*	144	*15.7*	71	*7.8*	*23.5*
Glasgow North East Sector	1,651	1,156	*70.0*	860	*74.4*	219	*18.9*	77	*6.7*	*25.6*
Glasgow North West Sector	1,679	1,089	*64.9*	863	*79.2*	147	*13.5*	79	*7.3*	*20.8*
Glasgow South Sector	2,347	1,632	*69.5*	1,102	*67.5*	365	*22.4*	165	*10.1*	*32.5*
Inverclyde	834	630	*75.5*	571	*90.6*	33	*5.2*	26	*4.1*	*9.3*
Renfrewshire	1,864	996	*53.4*	892	*89.6*	59	*5.9*	45	*4.5*	*10.4*
West Dunbartonshire	1,007	700	*69.5*	616	*88.0*	52	*7.4*	32	*4.6*	*12.0*
Total	11,807	7,199	*61.0*	5,672	*78.8*	1,028	*14.3*	499	*6.9*	*21.2*

Source: CHSP_PS, November 2018

Note: data is reported on children who completed Snellen Test Poor Acuity =6/9 or poorer with 6/12 or poorer with spectacles.

4.11. P7 Child Health Screening Information Systems

Child Health Surveillance System–Preschool (CHS-PS) currently supports the delivery of the pre-school vision screening programme across NHS Greater Glasgow and Clyde. School vision testing is supported by the Child Health Surveillance System- School (CHS-S). Both CHS-PS and CHS-S are being re-procured by NHS Scotland.

4.12. Pre- school and P7 Vision Screening Challenges and Future Priorities

- Ensure the co-operation of all nurseries to allow screening to take place taking into account GDPR requirements. Uptake is far higher in children who attend nursery (87.3%) compared to those not in nursery who are asked to attend hospital (12.4%).

- Improve the recording of children who attend an Optometrist as a result of pre-vision or Primary 7 vision screening.

- Ensure that changes in School Nursing provision for NHSGGC does not affect the Primary 7 vision screening programme; 21.2% of P7 children in NHSGGC have been identified with low visual acuity.

- Work with NHS Scotland and other boards to ensure the safe and effective continuity of vision screening activities during a change of IT systems.

Appendix 4.1

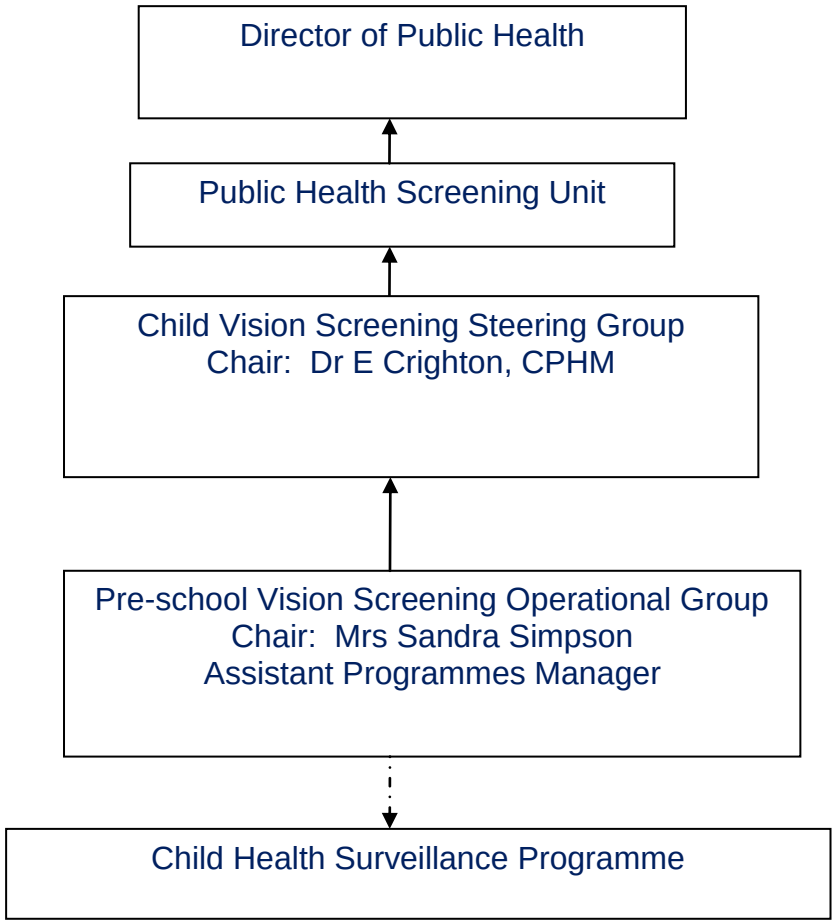
Members of Child Vision Screening Steering Group

Dr Emilia Crighton	Head of Health Services Section (Chair)
Mrs Denise Bratten	Optometrist
Mr Paul Burton	Information Manager
Mrs Sandra Simpson	Assistant Screening Programme Manager
Ms Samara Hodi	Head of Optometry
Mrs Patricia Mackay	Team Lead Children & Families, South Glasgow
Mrs Carolyn MacLellan	Lead Orthoptist
Mr Eddie McVey	Optometric Adviser
Ms Morven Campbell	Vice chair, AOC
Ms Arlene Polet	Children's & Families Team Lead, Inverclyde
Mrs Uzma Rehman	Programme Manager, Public Health
Mrs Diane Russell	Lead Orthoptist
Ms Elaine Salina	Principal Optometrist
Ms Anita Simmers	Head of Vision, Science Dept, GCU
Dr Kathy Spowart	Paediatrician, Community Child Health
Mrs Claudine Wallace	Lecturer in Orthoptics, GCU

Appendix 4.2

Reporting Structure

Child Vision Screening Steering Group



Key:
_____ Direct Reports
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Section 2

Adult Screening

Chapter 5 - Abdominal Aortic Aneurysm (AAA) Screening

Summary

An abdominal aortic aneurysm (AAA) is a dilatation of the aorta within the abdomen where the aortic diameter is 3.0 cm or more. Aneurysms are strongly linked to increasing age, hypertension, smoking, other vascular disease and a positive family history of AAA.

The aim of AAA screening is the early detection and elective repair of symptomatic AAA in order to prevent spontaneous rupture. Screening is associated with a 40% reduction in aneurysm related mortality. All men aged 65 years in the NHSGGC area are invited to attend AAA screening by a single ultrasound examination. Men aged over 65 years of age are able to self-refer to the programme. In 2017-2018 NHSGGC met 7 of the 10 programme KPIs.

In 2017-2018 5,913 men aged 65 were invited to participate in the AAA screening programme. 4,739 (80.1%) took up screening, exceeding the minimum uptake standard of 70%. 38 of these men (0.8%) were found to have an aneurysm measuring between 3.00 cm and 5.49 cm and are currently on surveillance. A further four of these men (0.1%) had an aneurysm measuring 5.5 cm or more that required surgical assessment and intervention.

Uptake is poorest in the most socio-economically deprived areas (75.3% in SIMD 1 vs. 88.8% in SIMD 5) and in ethnic minorities (53.8% for Black or Black British and 71% in Asian or Asian British vs. 82% for White British). There are also lower uptake rates in some HSCPs that are not wholly explained by socio-economic deprivation. An action plan to improve these inequalities in uptake has been agreed.

Chapter Contents

5.1. Background

An abdominal aortic aneurysm (AAA) is a dilatation of the aorta within the abdomen where the aortic diameter is 3.0 cm or more. Aneurysms are strongly linked to increasing age, hypertension, smoking, other vascular disease and a positive family history of AAA.

Studies have found that approximately 7% of men aged 65 were found to have an AAA. It is less common in men and women under aged 65 years. When an AAA ruptures less than half of patients will reach hospital alive. When an operation is possible, mortality is as high as 85%.

5.2. Aim of the Screening Programme and Eligible Population

The aim of AAA screening is the early detection and elective repair of symptomatic AAA in order to prevent spontaneous rupture. Screening is associated with a 40% reduction in aneurysm related mortality.

AAA screening was implemented across NHS Greater Glasgow and Clyde in February 2013. The performance and quality of the programme is monitored via defined National AAA Screening Standards[1] and Key Performance Indicators (KPIs)[2].

All men aged 65 years who are resident in the NHSGGC area are invited to participate in the AAA screening programme. Men aged over 65 years of age are able to self-refer to the programme.

5.3. Screening Test and Screening Pathway

The screening test involves a single abdominal scan using a portable ultrasound machine. The AAA IT application is used to appoint and manage the patient through their screening pathway. The application obtains the demographic details of the participants by linking with the Community Health Index (CHI). Screening takes place in the New Victoria Hospital, New Stobhill Hospital, Golden Jubilee Hospital, Renfrew Health Centre, Inverclyde Royal Hospital and Vale of Leven Hospital. Individuals whose aortic diameter is less than 3.0 cm are discharged. Individuals with a positive result from screening (AAA dimensions between 3.0 and 5.4 cm) will be offered interval surveillance scanning and treatment. Men with clinically significant AAA (over 5.5 cm) will be referred to secondary care for assessment **(Appendix 5.1).**

[1] http://www.healthcareimprovementscotland.org/our_work/cardiovascular_disease/screening_for_aaa/aaa_screening_standards.aspx (accessed October 2018)

[2] http://www.isdscotland.org/Health-Topics/Public-Health/AAA-Screening/2018-03-06-AAA-KPI-Definitions.pdf (accessed October 2018)

Individuals with an AAA over 5.5 cm are assessed in vascular surgical outpatient clinics to assess willingness and fitness for either surgery or for referral to interventional radiological services for assessment for endovascular aneurysm repair (EVAR). There is multidisciplinary team decision making for aneurysm patients (both screened and unscreened). Some patients will not go on to have an intervention, mainly due to fitness for surgery or a preference for no intervention after consultation and assessment.

Sometimes an image cannot be achieved if, for example, an individual has a high BMI, large abdominal girth, bowel gas or previous surgery, which can cause issues with visualisation of the aorta preventing accurate measurements and image capture using ultrasound. If an image cannot be achieved after two appointments the individual will be discharged from the programme and referred to Vascular Services for management locally.

5.4. Programme Performance and Delivery

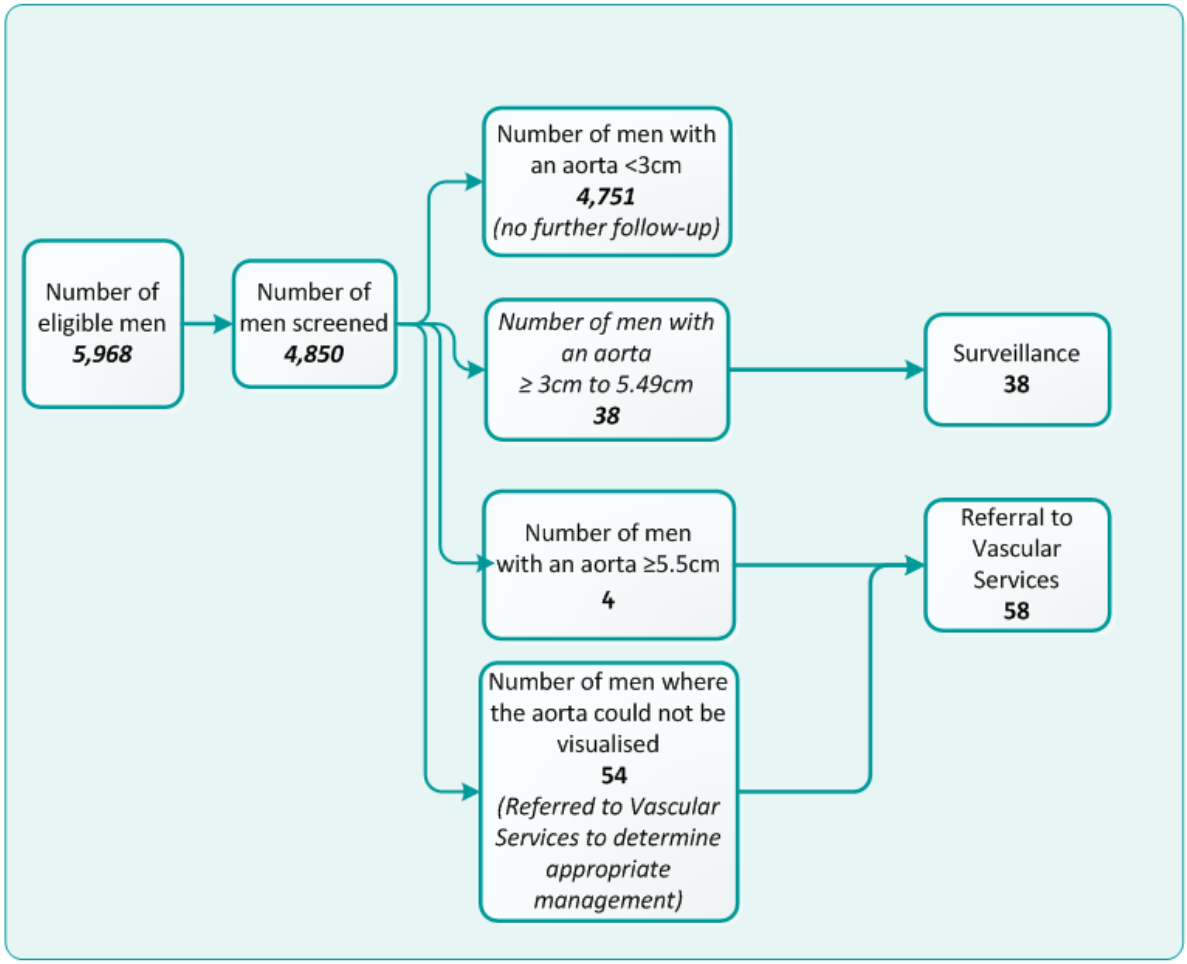
For the period 1st April 2017 to 31st March 2018, 5,916 men were eligible for screening. Of these, 4,739 men (80.1%) were screened before age 66 and 3 months. A further 41 men (over the age of 66 years) self referred to the AAA screening programme during this time period.

In addition to national performance monitoring via annually published KPIs, local monitoring is undertaken on an annual basis to explore any local variation in programme performance and quality. As a result of differences in data extract dates, numbers in local data analysis may differ from those presented in national reports.

An overview of NHGGC AAA screening programme activity during 2017/18 is provided in **Figure 5.1**.

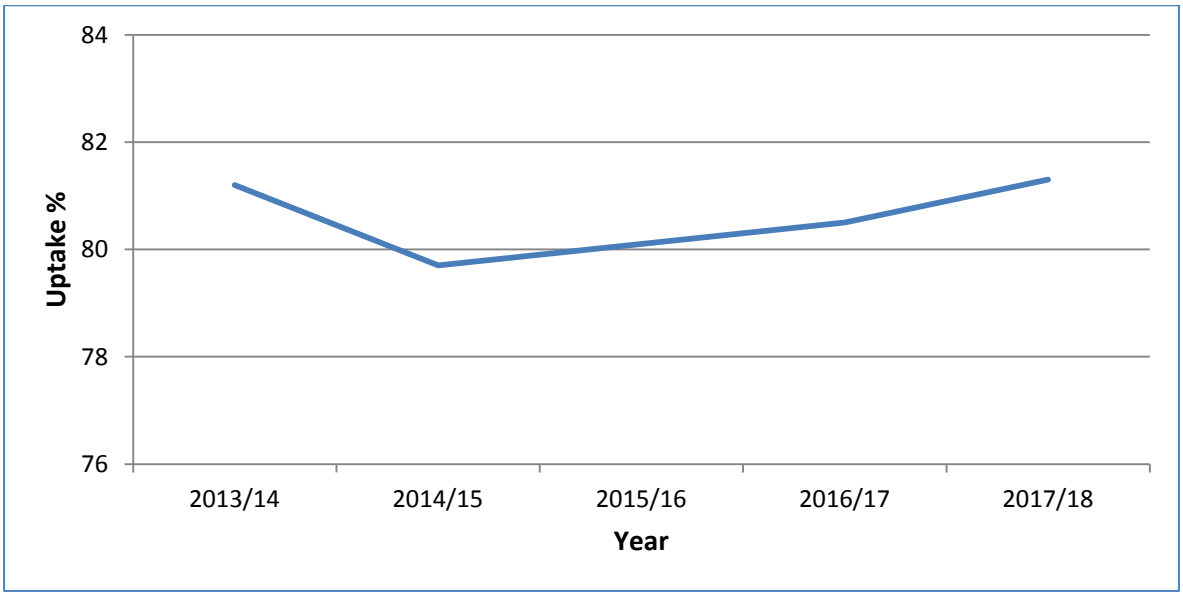
AAA screening was implemented across NHS Greater Glasgow and Clyde in February 2013. Uptake rate remained consistent since then at about 80%. In 2017/18 the highest uptake rate was recorded (81.3%) **(Figure 5.2).**

Figure 5.1 Overview NHSGGC AAA screening programme activity, 2017/18



Source: AAA Application, October 2018

Figure 5.2 Uptake of AAA in NHSGGC from 2013/14 – 2017/18



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Source: AAA Application 2018

The essential threshold for screening uptake (70%) was met across all deprivation quintiles. Overall, men who resided in the most deprived areas had uptake rates 13% lower than men residing in the least deprived areas (75.3% vs. 88.8% respectively) **(Table 5.2).**

Table 5.2 Uptake of AAA screening among eligible population by SIMD quintile for NHSGGC, 2017-2018

SIMD Quintile 2016	Not Screened	Screened	Total	*% Screened*
1 (Most Deprived)	484	1,474	1,958	*75.3*
2	196	765	961	*79.6*
3	144	667	811	*82.2*
4	148	784	932	*84.1*
5 (Least Deprived)	146	1,160	1,306	*88.8*
Total	**1,118**	**4,850**	**5,968**	***81.3***

Source: AAA Application, September 2018
Chi-Square Tests Linear-by-Linear Association p < 0.0001

The majority (95.9%) of men invited were of white ethnic origin **(Table 5.3).** Uptake of AAA screening differs between ethnic groups, with uptake high across all groups. However, due to low numbers in some ethnic groups it is not possible to directly compare programme uptake across ethnic subgroups.

Table 5.3 Uptake of AAA screening among eligible population by ethnicity for NHSGGC, 2017-2018

2001 Census Ethnic Group	Not Screened	Screened	Total	*% Screened*
White - British	880	4,020	4,900	*82.0*
White - Irish	130	544	674	*80.7*
White - any other white background	31	85	116	*73.3*
Asian or Asian British	49	120	169	*71.0*
Black or Black British	6	7	13	*53.8*
Other ethnic groups - Chinese	10	31	41	*75.6*
Other ethnic groups - any other ethnic group	7	38	45	*84.4*
Unclassified	≤5	≤5	10	*50.0*
Total	**1,118**	**4,850**	**5,968**	***81.3***

Source: AAA Application, OnoMap, September 2018

The essential threshold for screening uptake (70%) was met in all HSCPs, with a highest uptake rate of 88.2% in East Renfrewshire HSCP and the lowest uptake rate of 75.7% in Glasgow City HSCP North East Sector, a difference in uptake of 12.5%.

However, when the known effects of deprivation and ethnicity are taken into account by standardisation (Standardised Uptake Rate – SUR), the variation in uptake across

HSCPs persist, although slightly reduced (7.1% difference between highest and lowest), with 85.2% SUR in West Dunbartonshire HSCP compared to 78.1% SUR in Glasgow City HSCP – North West Sector **(Table 5.4).** This suggests that differences in other local factors are also important in AAA screening uptake. The factors will be investigated in 2019

Table 5.4 Indirectly standardised uptake of AAA screening among eligible population by Health & Social Care Partnership in NHSGGC, 2017-2018

HSCP	Not Screened	Screened	Total	*% Screened*	%SUR	% LCI	% UCI
East Dunbartonshire	83	592	675	*87.7*	***83.0***	*76.3*	*89.7*
East Renfrewshire	62	464	526	*88.2*	***83.3***	*75.7*	*90.8*
Glasgow North East Sector	201	626	827	*75.7*	***79.0***	*72.9*	*85.2*
Glasgow North West Sector	210	707	917	*77.1*	***78.1***	*72.3*	*83.8*
Glasgow South Sector	211	911	1,122	*81.2*	***83.0***	*77.6*	*88.3*
Glasgow City	*622*	*2,244*	*2,866*	*78.3*	**80.3**	*77.0*	*83.6*
Inverclyde	84	388	472	*82.2*	***82.7***	*74.5*	*90.9*
Renfrewshire	184	738	922	*80.0*	***78.9***	*73.2*	*84.6*
West Dunbartonshire	83	424	507	*83.6*	***85.2***	*77.1*	*93.4*
Total	1,118	4,850	5,968	*81.3*			

Source: AAA Application, September 2019; OnoMap
SUR = Standardised Uptake Rate; UCI = Upper Confidence Intervals; LCI = Lower Confidence Intervals

To enable further local analysis of uptake rates, geographical mapping at data zone level has been carried out. This illustrates that uptake rates in some pockets of NHSGGC were considerably lower than the rate of the HSCP they belonged to. Against a population target of 70%, 152 of the 1,456 data zones did not achieve 40% uptake, 112 of which were below 20%. Data zone maps for NHSGGC and by HSCP are available on the PHSU website[3]

Table 5.5 shows that 48 of the 5,968 men eligible for screening were registered with a learning disability (0.8%). Men who were registered with a learning disability were less likely to take up screening, compared to men who were not registered with a learning disability, (68.8% vs. 81.4%). This shows a decrease in uptake compared

[3] AAA Screening Uptake Data Zone maps: https://www.nhsggc.org.uk/your-health/public-health/public-health-screening-unit/reports/

to 2016/17 programme statistics however it should be noted that numbers of individuals registered with a learning disability are low.

Table 5.5 Uptake of AAA by Learning Disability in NHSGGC, 2017-2018

Learning Disability	Not Screened	Screened*	Total	*% Screened*
Rest of population	1,103	4,817	5,920	*81.4*
Registered with a LD	15	33	48	*68.8*
Total	1,118	4,850	5,968	*81.3*

*Attended screening by age 66 years
Source: AAA Application, Learning Disability, September 2018
Chi-Square Tests Linear-by-Linear Association p = 0.026

People registered on PsyCIS have had at least one episode of psychosis which is typically seen in patients with a severe or enduring mental illness. **Table 5.6** shows that 74 of the 5,968 men eligible for screening were registered on PsyCIS (1.2%). These individuals had poorer uptake of AAA Screening, 68.9% compared to 81.4% in the rest of the population.

Table 5.6 Uptake of AAA among people with severe and enduring mental illness in NHSGGC, 2017-2018

Severe and Enduring Mental Illness	Not Screened	Screened*	Total	*% Screened*
Rest of population	1,095	4,799	5,894	*81.4*
Registered on PsyCIS	23	51	74	*68.9*
Total	1,118	4,850	5,968	*81.3*

*Attended screening by age 66 years
Source: Source: AAA Application, PSYCIS, September 2018
Chi-Square Tests Linear-by-Linear Association p = 0.006

5.5. Abdominal Aneurysm Screening Results

Table 5.7 shows that 42 men (0.9%) had an enlarged aorta (≥3cm). Of these, 38 men (0.8%) had an aorta measuring between 3cm to 5.49cm, requiring surveillance scans and 4 men (0.1%) had a large aneurysm measuring 5.5 cm or more, requiring surgical assessment and intervention. Of the 41 men who self referred to the programme, less than 5 had an enlarged aorta (≥3cm).

Table 5.7 Abdominal Aneurysm screening results for NHSGGC, 2017-2018

	Aorta - Largest Measurement (cm)				
Result Type	**<3**	**≥3 - 5.49**	**≥5.5**	**Not Known**	**Total**
Negative	4,751	0	0	0	4,751
Non Visualisation	0	0	0	54	54
Positive	0	38	4	0	42
Technical Fail	0	0	0	3	3
Total	4,751	38	4	57	4,850

Source: AAA Application, September 2018

5.6. AAA Mortality and Incident Audit

The Public Health Screening Unit leads a programme of audit of AAA screening. A multi-disciplinary group reviews all AAA related mortality and incidents in relation to the screening programme. This is an addition to the already established system of reviewing the cases of patients who have died from a ruptured aorta at regular Morbidity and Mortality meetings.

The Mortality and Incident Audit was established in autumn 2018 and all relevant cases since the programme began in 2013 were reviewed. The group conducted the audit using national guidance[4]. This recommended the inclusion of a wider list of ICD-10 codes that would enable identification of all potential cases involving ruptured aorta, including but not solely those that had died from this complication.

Table 5.8 shows that the audit process identified 22 deaths identified as being AAA related in NHSGGC. Of these 14 had attended AAA Screening.

Table 5.8 Abdominal Aortic Aneurysm related mortality by screening status in NHSGGC, 2013-2018

AAA related death	**Attended screening**			**Total**
	DNA	**No**	**Yes**	
Don't know	0	0	1	1
No	1	0	7	8
Yes	0	7	6	13
Total	**1**	**7**	**14**	**22**

The review concluded that the deaths occurred in patients with aneurisms that were extensive and technically complex while undergoing investigations; patients with co morbidities requiring complex investigation; patients with post operative complications; and in patients deferring their appointments.

[4] NSS *Best Practice Guidance in relation to Standard 7 of the AAA Standards (v. May2018)*

5.7. AAA Key Performance Indicators

The AAA programme KPIs cover information on: invitation and attendance at screening, the quality of screening, and vascular referrals. NHSGGC met the essential threshold for seven of the 10 KPIs for the year ending March 2018 **(Appendix 5.2).**

Three KPIs were not met: The achievement of *KPI 2.1a: Percentage of screening encounters where aorta could not be visualised* was 3.3% against a target of 3%, due in the main to the high BMI of participants making them unsuitable for portable scanning. *KPI 1.4b: Percentage of quarterly surveillance appointments due where men are tested within 4 weeks of due date* was 87.4% against a target of 90%, this largely due to less frequent clinics in the least densely populated locations and cancelled clinics due to adverse weather. *KPI 3.2: The percentage of men with AAA ≥5.5cm deemed appropriate for intervention/ operated on by vascular specialist within eight weeks of screening* was 57.1% compared with the target of 60%, and this was due to patients being referred to other specialties, co-morbidities, and or patients needing ongoing further assessment by vascular services.

5.8. Quality Improvement

Healthcare Improvement Scotland's 2017 external quality assurance review of the AAA programme in Scotland[5] made a number of recommendations. In 2018 NHSGGC put plans in place to implement and monitor these. Key areas progressed are: robust governance and monitoring arrangements, job plans to include protected time to support the programme, patient experience is included, clinics risk assessed for lone working, mortality and incident audit, regular consideration of screening pathway data, and outcome data from vascular treatment is discussed by local governance groups.

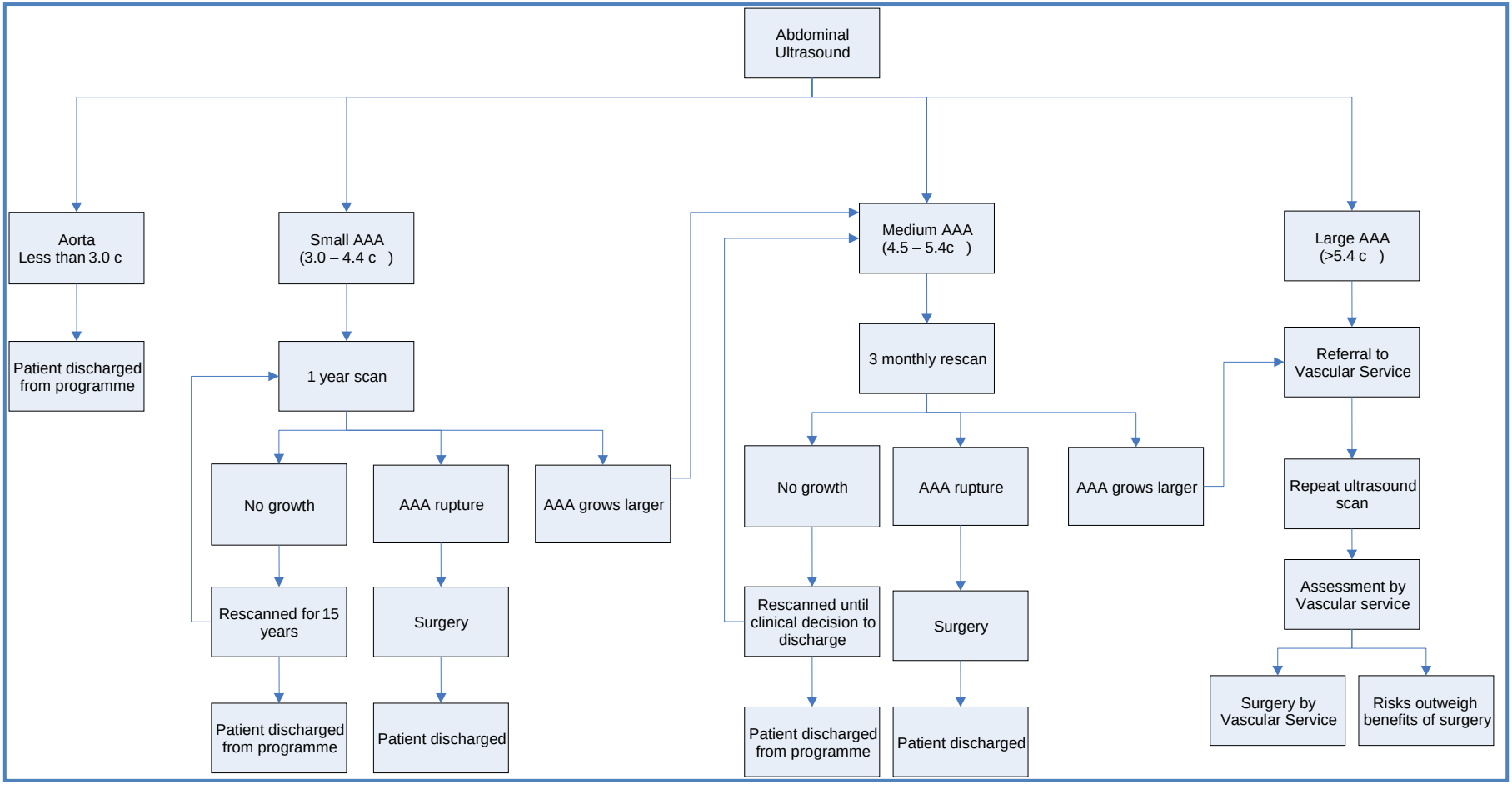
5.9. Challenges and Future Priorities

- To maintain the screening staffing level and screening locations to ensure stability in the delivery of AAA Screening Programme.
- To continue to monitor vascular waiting times.
- To continue to review uptake for men registered with a learning disability and for men registered with a severe and enduring mental illness, and work with specialist learning disability and mental health staff to develop approaches to support participation in AAA screening.
- The implementation of the NHSGGC Adult Screening Inequalities Action Plan (Appendix A) will enable a more coordinated approach to reducing inequalities in uptake through targeted intervention plans.

[5] http://www.healthcareimprovementscotland.org/our_work/cardiovascular_disease/screening_for_aaa/aaa_screening_review.aspx (Accessed 26th October 2018)

Appendix 5.1

Positive Abdominal Aortic Aneurysm Screening Pathway



Appendix 5.2

Abdominal Aortic Aneurysm Key Performance Indicators, NHS Greater Glasgow & Clyde (2015 – 2018)

KPI	Description	Essential Threshold	Desirable Threshold	Year ending 31st March 2015	Year ending 31st March 2016	Year ending 31st March 2017	Year ending 31st March 2018*
Invitation and attendance							
1.1	Percentage of eligible population who are sent an initial offer to screening before age 66	≥ 90%	100%	69.0%	99.9%	100.0%	99.9%
1.2	Percentage of men offered screening who are tested before age 66 and 3 months	≥ 70%	≥ 85%	79.7%	80.1%	80.5%	80.1%
1.3	Percentage of men residing in SIMD 1 areas (most deprived) offered screening who are tested before age 66 and 3 months;	≥ 70%	≥ 85%	72.8%	72.7%	73.1%	73.6%
1.4a	Percentage of annual surveillance appointments due where men are tested within 6 weeks of due date	≥ 90%	100%	93.3%	93.0%	94.0%	92.5%
1.4b	Percentage of quarterly surveillance appointments due where men are tested within 4 weeks of due date	≥ 90%	100%	96.7%	98.6%	92.1%	87.4%
Quality of screening							
2.1a	Percentage of screening encounters where aorta could not be visualised	< 3%	< 1%	1.6%	2.4%	2.8%	3.3%

2.1b	Percentage of men screened where aorta could not be visualised	< 3%	< 1%	1.4%	2.1%	2.3%	2.6%
2.2	Percentage of screened images that failed the quality assurance audit and required immediate recall	< 4%	< 1%	0.4%	1.4%	1.0%	1.1%
Referral, clinical intervention and outcomes							
3.1	Percentage of men with AAA≥5.5cm seen by vascular specialist within two weeks of screening	≥ 75%	≥ 95%	81.8%	100.0%	100.0%	91.7%
3.2	Percentage of men with AAA≥5.5cm deemed appropriate for intervention/ operated on by vascular specialist within eight weeks of screening	≥ 60%	≥ 80%	77.8%	53.8%	62.5%	57.1%
*2017-18 KPI data awaiting validation							

Appendix 5.3

Members of Abdominal Aortic Aneurysm Screening Steering Group (at March 2018)

Dr Emilia Crighton	Consultant in Public Health Medicine (Chair)
Mrs Karen Bell	Clinical Services Manager, Surgery & Anaesthetics
Mr Paul Burton	Information Manager
Mrs Lin Calderwood	HI&T Service Delivery Manager
Mrs Mairi Devine	Radiographer
Mrs Irene Fyfe	Health Records Services Manager
Mrs Antonella Grimon	AAA Data Administrator
Mrs Elaine Hagen	Screening Programme Support Officer, Screening
Dr Oliver Harding	Consultant in Public Health Medicine, NHS Forth Valley
Mrs Janice Hosie	Deputy Health Records Manager, eHealth
Ms Heather Jarvie	Public Health Programme Manager
Dr Ram Kasthuri	Consultant Interventional Radiologist
Ms Karen Loudon	Clinical Service Manager (Vascular)
Ms Heather McLeod	Sonographer, NHS Forth Valley
Mrs Elizabeth Rennie	Programme Manager, Screening Department
Ms Sandra Robertson	Radiology Department Manager, Forth Valley
Mrs Lynn Ross	General Manager, Diagnostics
Mr Wesley Stuart	Lead Clinician

Chapter 6 – Bowel Screening Programme

Summary

Colorectal (Bowel) Cancer was the third most common cancer in Scotland for both men and women in 2016. Ninety four percent of bowel cancers detected are among people aged over 50 years of age. In 2016, 770 people (400 men and 370 women) residing in the Greater Glasgow and Clyde area were diagnosed with bowel cancer. In the same year, 324 people (165 men and 159 women) with a diagnosis of bowel cancer died.

The aim of bowel screening is to detect bowel cancer at an early stage where treatment is more effective. In some cases, pre-cancerous polyps can be removed and cancer prevented. The programme invites all men and women between the ages of 50 – 74.

In 2016-18, 363,302 NHSGGC residents were invited to participate in the bowel screening programme. The overall uptake of screening was 52.3% (190,045), against a target of 60%. Uptake is poorest among men (49.4%), younger participants (aged 50-54 was 43.4%), socio-economically deprived residents (SIMD 1 was 42.5%), people with learning disabilities (34%), and among ethnic minorities (Asian or Asian British was 33.5%). There are also lower uptake rates in some HSCPs that are not wholly explained by socio-economic deprivation.

Overall, 2.5% (4,695 of 190,045) of completed screening tests were reported positive, meriting further investigation. Men have a higher positivity than women (2.9% vs. 2.1%); older people have higher positivity than younger people (3.3% aged 70-74 vs. 1.9% aged 50-54); and those living in our most deprived communities have higher positivity than the least deprived (3.5% vs. 1.6%).

A new screening test, FIT (quantitative faecal immunochemical test) was introduced in November 2017, accompanied by public information campaigns. NHSGGC reinstated the teaser letter to first time participants. Provisional data showed a 7.96% increase in uptake.

Chapter Contents

6.1. Background

Colorectal (Bowel) Cancer is the third most common cancer in Scotland for both men and women accounting for 11.8% of all cancers [6]. In 2016, the most recent year for which completed data is available, approximately 3,700 people in Scotland were newly diagnosed with the disease. Ninety four percent of bowel cancers detected are among people aged over 50 years of age[7].

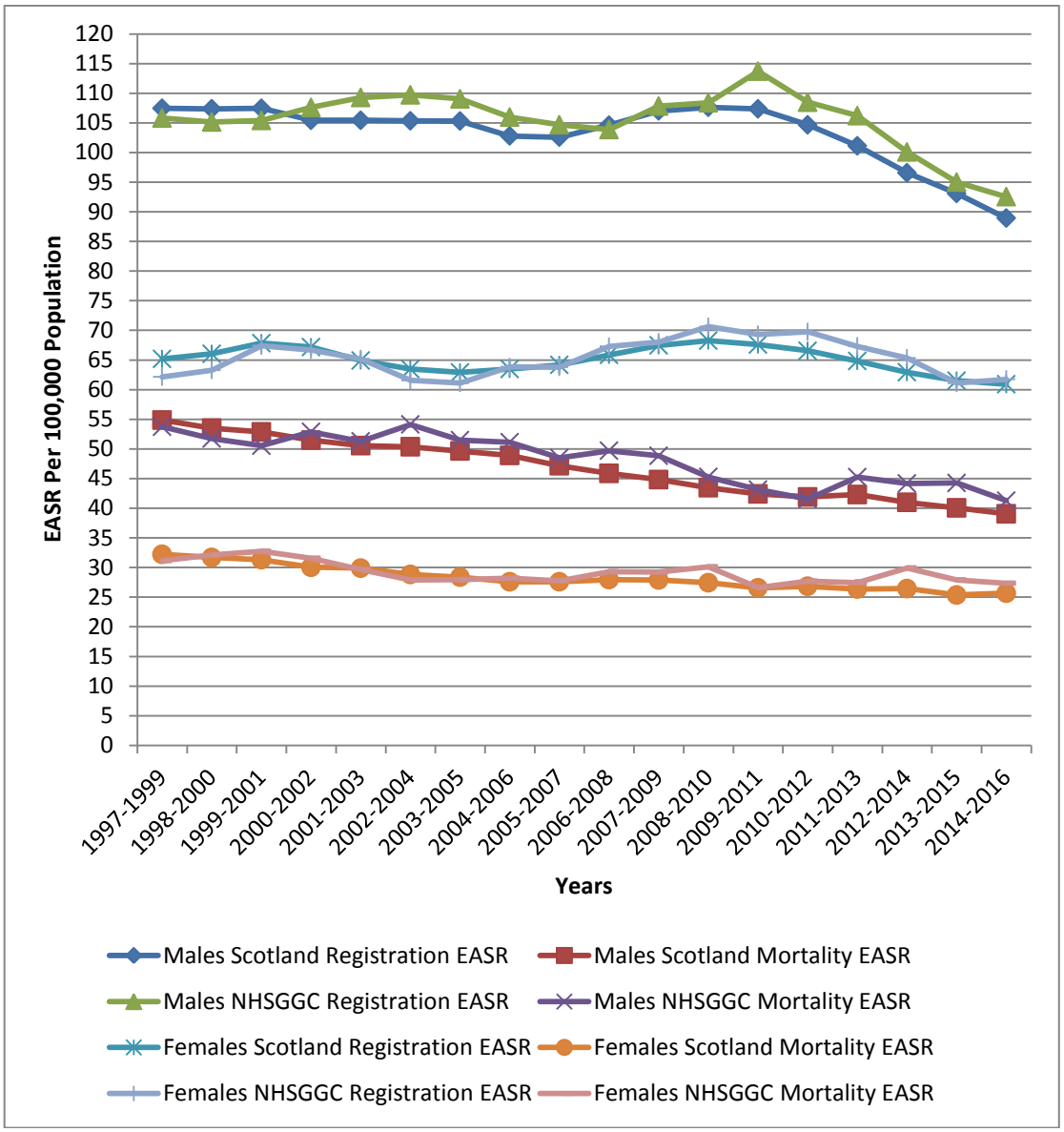
In 2016, 770 people (400 men and 370 women) residing in the NHSGGC area were diagnosed with bowel cancer[7]. This gives an age-standardised incidence rate of 91.5 per 100,000 of the population for men, higher than the Scotland rate of 83.9. For women the age-standardised incidence rate is 64.1 per 100,000 of the population, lower than the Scotland rate of 61.4[7]. In the same year, 324 people in NHSGGC (165 men and 159 women) with a diagnosis of bowel cancer died**,** giving an age-standardised mortality rate of 39.7 per 100,000 population for men and 27.3 per 100,000 population for women[7].

In the time period between 2006 and 2016, the age-standardised incidence rate of bowel cancer in Scotland decreased in both men and women (by 11.2% and 6% respectively). Age-standardised mortality rates also decreased in men by 16.7% and in women by 5.8%.

Standardised incidence and mortality rates over rolling 3 year periods for bowel cancer for NHSGGC and Scotland are illustrated in **Figure 6.1**.

[6] http://www.isdscotland.org/Health-Topics/Cancer/Publications/2018-04-24/Cancer_in_Scotland_summary_m.pdf (accessed October 2018)
[7] http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics/Colorectal/#colorectal (accessed October 2018)

Figure 6.1: Colorectal Cancer Registration & Mortality 1997-2016 (Rolling 3 Years) European Age Standardised Rate (EASR) Per 100,000 Population.



Source: Registration Source: ISD April 2018, Mortality Source: ISD October 2017

The main preventable risk factors for bowel cancer are consumption of red and processed meats, overweight, alcohol consumption; and smoking[8].

Recent decreases in incidence might reflect the removal of pre-malignant polyps at colonoscopies resulting from the Bowel Screening Programme.

The new FIT screening test was introduced in November 2017, accompanied by public information campaigns. NHSGGC added an information letter prior

[8] http://www.isdscotland.org/Health-Topics/Cancer/Publications/2018-04-24/Cancer_in_Scotland_summary_m.pdf (accessed October 2018)

to screening, to further encourage participation. In order to ensure service quality, a system has been put in place to monitor colonoscopy waiting lists.

6.2. Aim of the Screening Programme

The Scottish Bowel Screening Programme was fully implemented across Scotland in 2009.

The purpose of bowel screening is to detect colorectal cancers at the earliest possible time so that treatment may be offered promptly. It is believed that very early detection of colorectal cancers in this way can result in more effective treatment which may be more likely to reduce deaths from colorectal cancer. In addition, the removal of precancerous lesions could lead to a reduction in the incidence of colorectal cancer.

The National Bowel Screening Programme performance and quality is monitored via defined Key Performance Indicators (KPI's)[9] and National Bowel Screening Standards[10].

6.3. Eligible Population

The programme invites all men and women between the ages of 50 – 74 years of age registered with a General Practice. Other eligible individuals who are not registered with a General Practice such as prisoners, armed forces, homeless and individuals in long-stay institutions are also able to participate following NHS Greater Glasgow and Clyde local agreements. All eligible individuals will be routinely recalled every two years. Individuals may request screening above the age of 74.

6.4. The Screening Test and Pathway

In November 2017 a new test, the quantitative Faecal Immunochemical Test (FIT) was introduced throughout Scotland. This test is recommended as the first choice for population-wide colorectal cancer screening by the European Guidelines for Quality Assurance in Colorectal Cancer Screening[11]. Previous to this date, the Guaiac Faecal Occult Blood test (gFOBt) testing kit was used.

Both kits are completed at home and returned to the National Bowel Screening Centre in Dundee for analysis. However, FIT is easier to do, requiring only one sample (rather than the three for gFOBt), and this gives it higher user acceptability. FIT is also more accurate meaning that it is better at

[9] http://isdscotland.org/Health-Topics/Cancer/Bowel-Screening/ (accessed October 2018)
[10] http://www.healthcareimprovementscotland.org/our_work/cancer_care_improvement/programme_resources/bowel_screening_standards.aspx(accessed October 2018)
[11] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4482205/ (accessed January 2018)

detecting cancers and also better at determining patients who are unlikely to have cancer.

The National Bowel Screening Centre in Dundee issues invitation letters and screening kits to all eligible residents of NHSGGC to carry out the screening test at home. The kits are then posted by return to the National Laboratory for processing.

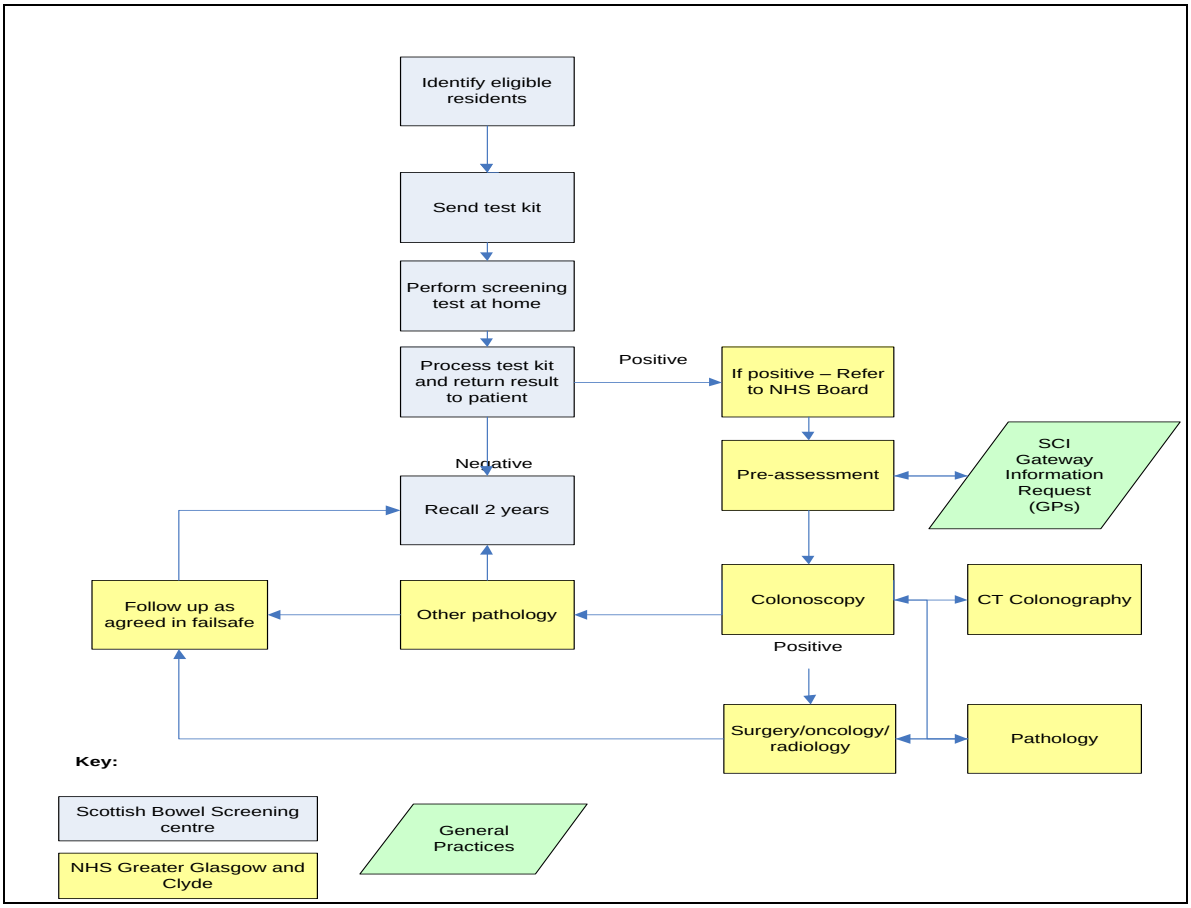
After analysis, the National Centre reports the results to patient, GP Practice and Board. The patient is informed by letter, an electronic notification is sent to the patient's general practitioner and results of all positive tests are sent to the Board via an IT system.

Patients with positive screening results are invited to contact NHS Greater Glasgow and Clyde administrative staff to arrange a telephone assessment and be offered a colonoscopy. Patients who are unable to undergo colonoscopy will be offered a CT colonography. If required, patients are then referred for further diagnostic investigations and treatment. Some patients may not be offered a colonoscopy, common reasons being an inability to tolerate any form of bowel prep, a recent change to health, a previous failed colonoscopy, or unsuitability due to physical incapability.

Anyone who has a positive result will automatically be invited again in 2 years time, unless a permanent exclusion is placed on their record.

Figure 6.2 provides an overview of the bowel screening pathway.

Figure 6.2 Overview of bowel screening pathway



If a patient refuses or does not turn up for colonoscopy, a letter is sent to the patient and their GP, asking them to get in touch within 6 months if they change their minds. Otherwise they will be removed from the waiting list. The patient will be invited to take part in bowel screening in two years' time.

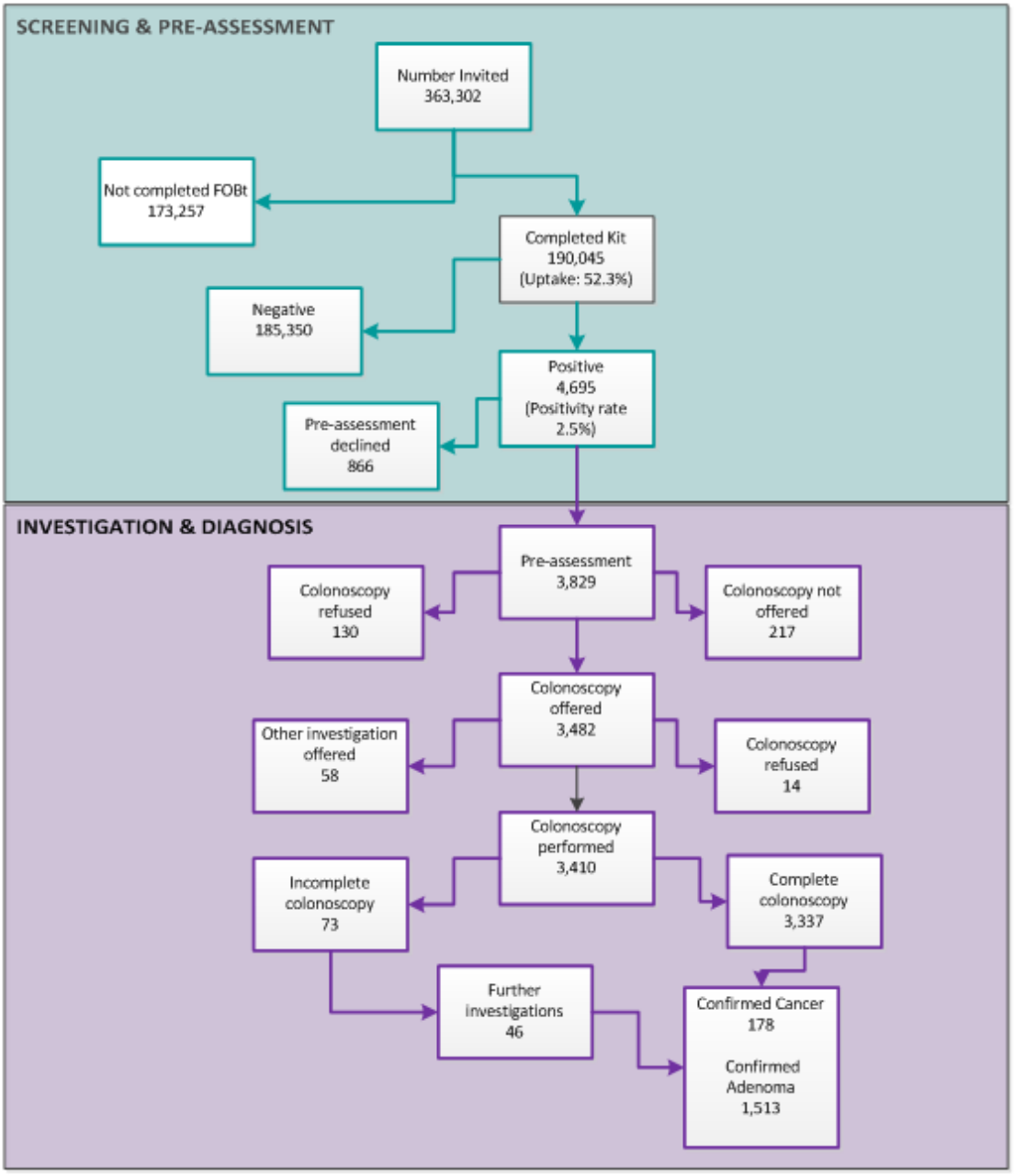
6.5. Programme Performance and Delivery

The bowel screening programme KPIs cover information on uptake of screening (completed kits), results of screening, quality of colonoscopy, and cancer diagnosis and staging. The KPIs are reported for a two year (screening) period. Appendix 6.1 summarises NHSGGC activity performance against KPIs for the time period 1st November 2015 and 31st October 2017.

NHSGGC does not meet the screening uptake KPI of 60%; the proportion of people with a positive screening result is higher than in the rest of Scotland resulting in higher proportional demand for colonoscopies; the waiting times for colonoscopy are longer than in the rest of Scotland and the quality of endoscopy (evidenced by completion rate and adenoma detection rate) is higher than the rest of Scotland.

Figure 6.3 summarises bowel screening activity between April 2016 and March 2018. During this time period, 363,302 NHSGGC residents were invited for bowel screening. Just over half (52.3%) of those invited returned the screening test, of which 4,695 tested positive (2.5%). Of those individuals who had a positive result, 3,829 (81.6%) accepted a nurse pre-assessment and almost three quarters (74%) had a colonoscopy. Subsequently, 175 cancers and 1,439 adenomas were detected.

Figure 6.3 Movement of eligible NHSGGC residents through bowel screening pathway (1 April 2016 to 31 March 2018)



Source: Bowel Screening IT system (May 2018)

Analysis was undertaken to explore variations in uptake by sex, age, deprivation, ethnicity, learning disability and Health and Social Care Partnership (HSCP) area.

Men were significantly less likely to return a bowel screening test than women (49.4% vs. 55.1% respectively) **(Table 6.1).**

Table 6.1 Uptake of bowel screening by sex in NHSGGC, 2016-18

Sex	Not Screened	Screened	Total	*% Screened*
Male	91,024	88,949	179,973	*49.4*
Female	82,233	101,096	183,329	*55.1*
Total	**173,257**	**190,045**	**363,302**	***52.3***

Source: Bowel Screening IT system (May 2018)
Chi-Square Tests $p < 0.0001$

There was progressively greater uptake of bowel screening with increasing age **(Table 6.2).** Uptake was lowest among those who were first invited for screening (aged 50-52 years), at 42.4% and increased to 61.7% between 70 and 74 years. This is an improvement on the previous year where no age groups had achieved the minimum uptake target of 60%, this year both the 65-69 and the 70-74 age groups achieved the target.

Table 6.2 Uptake of bowel screening by age in NHGGC, 2016-18

Age Group	Not Screened	Screened	Total	*% Screened*
50-54	63,500	48,738	112,238	*43.4*
(50-52)	(43,311)	(31,863)	(75,174)	*(42.4)*
55-59	42,305	42,193	84,498	*49.9*
60-64	25,672	32,014	57,686	*55.5*
65-69	26,757	42,897	69,654	*61.6*
70-74	15,023	24,203	39,226	*61.7*
Total	**173,257**	**190,045**	**363,302**	***52.3***

Source: Bowel Screening IT system (May 2018)
Chi-Square Tests Linear-by-Linear Association $p < 0.0001$

The difference in uptake between men and women was greatest at younger ages and much smaller at older ages **(Table 6.8).**

There was a consistent pattern that uptake of bowel screening programme increased with decreasing levels of deprivation **(Table 6.3).** It was lowest in people living in the most deprived Board areas (42.5%) and highest in the least deprived areas (64.1%).

Table 6.3 Uptake of bowel screening by deprivation in NHSGGC, 2016-18

SIMD Quintile 2016	Not Screened	Screened	Total	*% Screened*
1 (Most Deprived)	72,440	53,578	126,018	*42.5*
2	30,485	30,041	60,526	*49.6*
3	22,146	26,164	48,310	*54.2*
4	20,807	31,290	52,097	*60.1*
5 (Least Deprived)	27,379	48,972	76,351	*64.1*
Total	173,257	190,045	363,302	*52.3*

Source: Bowel Screening IT system (May 2018)
Chi-Square Tests Linear-by-Linear Association p < 0.0001

Uptake of screening is lower than the target 60% in all ethnic groups in NHSGGC, but it is poorest in the non-white population **(Table 6.4).** The lowest uptake of bowel screening is among Asian / Asian British and Black / Black British people.

Table 6.4 Uptake of bowel screening by ethnicity in NHSGGC, 2016-18

2001 Census ethnic group	Not Screened	Screened	Total	*% Screened*
White - British	141,267	163,232	304,499	*53.6*
White – Irish	17,069	17,666	34,735	*50.9*
White - any other white background	4,653	3,369	8,022	*42.0*
Asian or Asian British	5,715	2,875	8,590	*33.5*
Black or Black British	516	305	821	*37.1*
Other ethnic groups - Chinese	1,150	1,069	2,219	*48.2*
Other ethnic groups - any other ethnic group	2,188	1,176	3,364	*35.0*
Unclassified	699	353	1,052	*33.6*
Total	**173,257**	**190,045**	**363,302**	***52.3***

Source: Bowel Screening IT system (May 2018); OnoMap

There are large variations in bowel screening uptake across HSCPs **(Table 6.5).** They range from 45.8% in Glasgow City HSCP North East Sector to 62.4% in East Dunbartonshire HSCP. Only two HSCPs meet the minimum target of 60%. However, when the known effects of age, sex, deprivation and ethnicity are taken into account by standardisation, the differences in uptake across HSPCs are much smaller (SUR% ranging from 51.6% to 56%). This tells us that most of the differences in uptake across HSCP's is explained by their differences in population demographics rather than local practice.

Table 6.5 Indirectly standardised uptake of bowel screening by HSCP in NHGGC, 2016-18

HSCP	Not Screened	Screened	Total	% Screened	SUR %	SUR % LCI	SUR % UCI
East Dunbartonshire	14,218	24,068	38,286	*62.4*	***56.0***	*55.2*	*56.7*
East Renfrewshire	12,119	18,843	30,962	*60.1*	***54.2***	*53.4*	*54.9*
Glasgow City	*92,896*	*82,197*	*175,093*	*52.3*	***51.9***	*52.6*	*52.3*
Glasgow North East Sector	29,074	24,571	53,645	*45.8*	***52.9***	*52.2*	*53.6*
Glasgow North West Sector	28,653	26,174	54,827	*47.7*	***51.6***	*51.0*	*52.2*
Glasgow South Sector	35,169	31,452	66,621	*47.2*	***52.3***	*51.8*	*52.9*
Inverclyde	13,043	15,318	28,361	*54.0*	***55.3***	*54.5*	*56.2*
Renfrewshire	26,200	33,244	59,444	*55.9*	***55.2***	*54.6*	*55.8*
West Dunbartonshire	14,781	16,375	31,156	*52.6*	***55.5***	*54.6*	*56.3*
Total	**173,257**	**190,045**	**363,302**	***52.3***			

Source: Bowel Screening IT system (May 2018) OnoMap
SUR = Standardised Uptake Rate; UCI = Upper Confidence Intervals; LCI = Lower Confidence Intervals

To enable further local analysis of uptake rates, geographical mapping at data-zone level has been carried out. This illustrates that uptake rates in some pockets of NHSGGC can be low. Against a population target of 60%, 241 of the 1456 data-zones did not achieve 40% uptake, two of which were below 20%. Data-zone maps for NHSGGC and by HSCP are available on the PHSU website[12]

Table 6.6 shows that 2,414 of the 363,302 individuals eligible for screening were registered with a learning disability (0.7%). People who were registered with a learning disability had poorer uptake of bowel screening**,** 34% compared to 52.3% in the rest of the population.

[12] Bowel Screening Uptake Data Zone maps: https://www.nhsggc.org.uk/your-health/public-health/public-health-screening-unit/reports/

Table 6.6 Uptake of bowel screening by learning disability in NHGGC, 2016-18

Learning Disability	Not Screened	Screened	Total	*% Screened*
Rest of population	171,664	189,224	360,888	*52.4*
Registered with a LD	1,593	821	2,414	*34.0*
Total	173,257	190,045	363,302	*52.3*

Source: Bowel Screening IT system (May 2018), Learning Disability Register (April 2018)
Chi-Square Tests $p < 0.0001$

People registered on PsyCIS have had at least one episode of psychosis which is typically seen in patients with a severe or enduring mental illness. **Table 6.7** shows that 4,157 of the 363,302 people eligible for screening were registered on PsyCIS (1.1%). These individuals had poorer uptake of Bowel Screening, 34.9% compared to 52.5% in the rest of the population.

Table 6.7 Uptake of Bowel screening among people with severe and enduring mental illness in NHS Greater Glasgow and Clyde, 1st April 2016-31st March 2018

Severe and Enduring Mental Illness	Not Screened	Screened	Total	*% Screened*
Not Registered	170,552	188,593	359,145	*52.5*
Registered on PsyCIS	2,705	1,452	4,157	*34.9*
Total	173,257	190,045	363,302	*52.3*

Source: Bowel Screening IT system (May 2018)
Chi-Square Tests $p < 0.0001$

Since the implementation of the new FIT test, early local management data show an increase in screening uptake of 7.96%.This is higher than the 5% increase in uptake that was originally predicted. In addition, in those who accepted the screening, the positive detection rate increased by 1.30%.

6.6. Screening Test Positivity

Overall, about 2.5% (4,695 of 190,045) of completed screening test were reported positive, meriting further investigation. Men have a higher positivity than women (2.9% vs. 2.1%, respectively); older people have higher positivity than younger people (3.3% aged 70-74 vs. 1.9% aged 50-54); and those living in our most deprived communities have higher positivity than the least deprived (3.5% vs. 1.6%, respectively) **(Tables 6.8 and 6.9).**

Table 6.8 Uptake for Bowel screening and positivity rate by age and sex for NHGGC, 2016-18

Gender	Age Group					
	50-54	55-59	60-64	65-69	70-74	All
Male Uptake (%)	39.7	47.0	53.0	59.7	60.9	49.4
Female Uptake (%)	47.3	52.8	58.0	63.4	62.4	55.1
Total Uptake (%)	**43.4**	**49.9**	**55.5**	**61.6**	**61.7**	**52.3**
Male Positivity (%)	2.2	2.6	2.9	3.3	4.1	2.9
Female Positivity (%)	1.6	1.9	2.1	2.4	2.7	2.1
Total Positivity (%)	**1.9**	**2.3**	**2.5**	**2.8**	**3.3**	**2.5**

Source: Bowel Screening IT system (May 2018)
Chi-Square Tests Linear-by-Linear Association p < 0.0001

Table 6.9 Bowel screening positivity rate by deprivation for NHS Greater Glasgow and Clyde, 2016-18

SIMD Quintile 2016	Negative	Positive	Total	*% Positive*
1 (Most Deprived)	51,715	1,863	53,578	*3.5*
2	29,191	850	30,041	*2.8*
3	25,545	619	26,164	*2.4*
4	30,687	603	31,290	*1.9*
5 (Least Deprived)	48,212	760	48,972	*1.6*
Total	**185,350**	**4,695**	**190,045**	***2.5***

Chi-Square Tests Linear-by-Linear Association p < 0.0001
Source: Bowel Screening IT system (May 2018)

There was no significant difference in positivity between people registered with a learning disability and the rest of the population **(Table 6.10).**

Table 6.10 Bowel screening positivity rates by learning disability for NHSGGC, 2016-18

Learning Disability	Negative	Positive	Total	*% Positive*
Rest of population	184,557	4,667	189,224	*2.5*
Registered with a LD	793	28	821	*3.4*
Total	**185,350**	**4,695**	**190,045**	***2.5***

Source: Bowel Screening IT system (May 2018); Learning Disability Register (May 2018)
Chi-Square Tests p = 0.143

6.7. Adenoma and Polyp Detection

Of the 4,695 people who had a positive screening test, 3,410 people underwent a colonoscopy. Of these, 56.7% had a polyp detected. 44.4% had a confirmed adenoma detected and a further 178 people had a confirmed colorectal cancer diagnosis.

Table 6.11 shows the proportion of polyps identified at colonoscopy and the adenoma pathology diagnosis. 65.2% of men and 46.3% of women who underwent colonoscopies had polyps. Adenomas were diagnosed in 52.4% of men and 34.6% of women.

Table 6.11 Adenoma and polyp detection rate by age and gender in NHS GGC, 2016-18

Age Group	Patients having investigations* performed			% Polyps Detected			% Adenomas Detected		
	M	F	Tot	M	F	Tot	M	F	Tot
50-54	376	317	693	*58.5*	*34.4*	*47.5*	*46.3*	*23.7*	*35.9*
55-59	391	317	708	*64.7*	*41.0*	*54.1*	*51.9*	*28.1*	*41.2*
60-64	326	249	575	*64.1*	*47.0*	*56.7*	*54.9*	*36.5*	*47.0*
65-69	479	404	883	*68.7*	*53.5*	*61.7*	*53.0*	*42.3*	*48.1*
70-74	307	244	551	*70.0*	*56.1*	*63.9*	*56.7*	*42.2*	*50.3*
Total	1879	1531	3410	*65.2*	*46.3*	*56.7*	*52.4*	*34.6*	*44.4*

Source: Bowel Screening IT system (Data extracted: May 2018)
* Colonoscopy or other investigation

Table 6.12 shows the detection rate by gender and deprivation. Whilst more people from areas of greatest deprivation have had investigations performed, the detection rate of polyps and adenomas is roughly similar across the SIMD quintiles with higher polyp and adenoma detection rates among males.

Table 6.12 Polyp, Adenoma and Cancer detection rate by SIMD and gender in NHS GGC, 2016-18 (M=Male; F=Female)

SIMD Quintile 2016	Patients having investigations* performed			% Polyps Detected			% Adenomas Detected			% Cancers Detected		
	M	F	Tot	M	F	Tot	M	F	Tot	M	F	Tot
1	720	605	1,325	64.2	45.0	55.4	51.5	34.2	43.6	5.2	8.5	6.4
2	314	286	600	67.5	42.3	55.5	55.1	29.4	42.8	9.9	11.6	10.5
3	246	198	444	63.4	47.5	56.3	50.4	32.8	42.6	11.5	12.8	12.0
4	276	186	462	65.9	55.4	61.7	51.4	43.0	48.1	9.9	10.7	10.2
5	323	256	579	66.3	46.5	57.5	53.9	36.3	46.1	11.2	10.9	11.1
Total	**1,879**	**1,531**	**3,410**	**65.2**	**46.3**	**56.7**	**52.4**	**34.6**	**44.4**	**8.6**	**10.3**	**9.2**

Source: Bowel Screening IT system (Data extracted: May 2018)
* Colonoscopy or other investigation

NHSGGC interval cancer analysis looks at all cancer diagnoses during the calendar year and links to screening history. Data are presented in **Table 6.13** and shows the numbers of all detected colorectal cancers diagnosed by Dukes staging during 2016 to 2017. Patients whose bowel cancers are detected through screening are three times more likely to be diagnosed with earliest stage cancers and half as likely to have widespread, metastatic cancer when diagnosed compared to those who have symptoms. In 2016 of the 426 people diagnosed with bowel cancer 120 (28.2%) were screen detected. In 2017, 403 people were diagnosed with bowel cancer in NHSGGC, of which 85 (21.1%) were screen detected.

Table 6.13 Dukes' stage and mode of detection of colorectal cancel for NHSGGC, 2016 and 2017

Detection Mode	DUKES STAGE							
	99	A	B	C1	C2	D	Total	%
Year 2016								
Interval	7	15	26	23	1	23	95	*24.4*
Post Colonoscopy	0	1	1	1	0	0	3	*0.8*
Screen	12	43	27	33	3	2	120	*30.8*
Symptomatic	55	22	47	27	7	50	208	*53.3*
Total	74	81	101	84	11	75	426	
Year 2017								
Interval	10	20	21	20	2	17	90	*22.3*
Post Colonoscopy	0	0	0	0	0	0	0	*0.0*
Screen	6	42	13	21	0	3	85	*21.1*
Symptomatic	54	30	49	37	5	53	228	*56.6*
Total	70	92	83	78	7	73	403	

Source: NHSGGC Bowel Screening Application & Cancer Audit, November 2018

6.8. Quality Improvement in Colonoscopy

The Public Health Screening Unit leads a programme of audit of bowel screening. It has been focused on the quality of colonoscopy services but may in the future extend to other parts of the screening pathway. A multi-disciplinary group reviews the performance of all individuals who carry out colonoscopy as part of screening. Three main measures are recorded: adenoma detection rate; completion rate; and complication rate. It is expected that all bowel screening colonoscopists will undertake a minimum of 200 unselected colonoscopies per year, and that they will have a minimum completion rate of 90% and a minimum adenoma detection rate of 35% in bowel screening colonoscopies. Any complications identified are flagged to sectoral clinical management teams for discussion at local Morbidity and Mortality meetings, and it is expected that outcomes will be shared across the health board. Post colonoscopy cancer rates are now being audited. At the time of writing, a set of minimum standards and expected responses is being drafted.

New NHSGGC guidelines on the endoscopic management of complex polyps are being drafted. A pre-guideline survey of polyp management will be conducted and repeated after the guidelines have been implemented to measure their impact.

6.9. Challenges and Future Priorities

- To continue to monitor colonoscopy waiting times, which have increased since the introduction of FIT, and to put in place appropriate actions to reduce them.

- To monitor the implementation of the new FIT test in NHSGGC and its impact upon inequalities and uptake.

- The development of a NHSGGC Inequalities Plan for Adult Screening programmes (Appendix A) will enable a more coordinated approach to reducing inequalities in uptake through targeted intervention plans, including working with specialist learning disability and mental health staff to develop approaches to support participation in bowel screening for their patients.

- To continue to work in partnership with CRUK and Bowel Cancer UK to support GP practices and communities to support eligible patients to participate in bowel screening programme; share experience from the best performing HSCPs.

Appendix 6.1

Key Performance Indicators: May 2018 data submission

KPI	Key Performance: Indicator Description	Target	Scotland %	NHSGCC %
Screening Uptake				
1.	Overall uptake of screening - percentage of people with a final outright screening test result, out of those invited.	60%	55.6%	51.0%
2.	Overall uptake of screening by deprivation category *- percentage of people with a final outright screening test result for which a valid postcode is available, *by Scottish Index of Multiple Deprivation (SIMD) quintile 1 (most deprived) to quintile 5 (least deprived)	60%	42.3% Quintile 1	41.2% Quintile 1
			50.4% Quintile 2	48.4% Quintile 2
			57.0% Quintile 3	53.2% Quintile 3
			61.6% Quintile 4	58.9% Quintile 4
			65.3% Quintile 5	63.2% Quintile 5
3.	Percentage of people with a positive test result, out of those with a final outright screening test result.	N/A	2.07%	2.40%
Referral, clinical intervention and outcomes				
4.	Percentage of people where the time between the screening test referral date 0 to 4 weeks >4 to 8 weeks > 8 weeks	N/A	57.6% 33.3% 9.1%	44.8% 44.3% 10.9%
5.	Percentage of people with a positive screening test result going on to have a colonoscopy performed.	N/A	78.5%	76.0%
6.	Percentage of people having a completed colonoscopy, out of those who had a colonoscopy performed.	90%	95.4%	98.7%
7.	Percentage of people requiring admission for complications arising directly from the colonoscopy, out of those who had a colonoscopy performed.	N/A	0.46%	0.4%
8.	Percentage of people with colorectal cancer, out of those with a final outright screening test result.	N/A	0.105%	0.106%
9-14.	Percentage of people with colorectal cancer staged as 9. Dukes' A. 10. Dukes' B. 11. Dukes' C1. 12. Dukes' C2. 13. Dukes' D. 14. Dukes' Not known.	N/A	37.9% 24.6% 23.8% 2.7% 5.7% 2.8%	40.4% 21.2% 26.1% 1.5% 3.0% 3.9%

15 – 16.	Percentage of people with colorectal cancer 15. Where the stage has not yet been supplied. 16. That has a recorded stage	N/A	2.5% 97.5%	3.9% 96.1%
17.	Percentage of people with polyp cancer out of those with a final outright screening test result.	N/A	0.020%	0.015%
18.	Percentage of people with polyp cancer, out of those with colorectal cancer.	N/A	19.2%	13.8%
19.	Percentage of people with adenoma as the most serious diagnosis, out of those with a final outright screening test result.	N/A	0.613%	0.717%
20.	Percentage of people with high risk adenoma as the most serious diagnosis, out of those with a final outright screening test result.	N/A	0.086%	0.094%
21.	Percentage of people with a colorectal cancer, out of those with a positive screening test result and a colonoscopy performed.	N/A	6.4%	5.8%
22.	Percentage of people with adenoma, out of those with a positive screening test result and a colonoscopy performed.	N/A	37.5%	39.4%
23.	Percentage of people with high risk adenoma, out of those with a positive screening test result and a colonoscopy performed.	N/A	5.3%	5.1%
24.	Percentage of people with high risk adenoma or a colorectal cancer, out of those with a positive screening test result and a colonoscopy performed.	N/A	11.6%	10.9%
25.	Percentage of people with a malignant outcome or adenoma, out of those with a positive screening test result and a colonoscopy performed.	N/A	43.8%	45.2%
26.	Percentage of people with a colorectal cancer that is a malignant neoplasm of the: colon (ICD-10 C18) rectosigmoid junction (ICD-10 C19) rectum (ICD-10 C20)	N/A	66.2% 3.1% 30.7%	63.5% -% 36.5%

Appendix 6.2

Members of Bowel Screening Steering Group (as at March 2018)

Dr Emilia Crighton	Deputy Director of Public Health, Chair
Mrs Fiona Aitken	Endoscopy W/L Coordinator
Mrs Margaret Anderson	Lead Nurse - Endoscopy
Dr Stuart Ballantyne	Lead Clinician for Radiology
Mr Paul Burton	Information Manager
Mrs Lin Calderwood	H&IT Service Delivery Manager
Mrs Lisa Cohen	Facilitator Manager: West of Scotland
Mrs Ailsa Connelly	Lead Nurse, New VIC
Dr Fraser Duthie	Lead Clinician for Pathology
Mr Patrick Finn	Consultant Surgeon, RAH
Ms Ailsa Forsyth	Lead Nurse, GGH
Miss Irene Fyfe	Health Records Manager
Dr Rachel Green	Chief of Medicine, Diagnostics
Dr Rob Henderson	CPHM, NHS Highland
Ms Janice Hosie	Deputy Site Manager, GRI
Ms Julie Huntly	Lead Nurse, Clyde
Ms Heather Jarvie	Programme Manager, Adult Screening
Mrs Alyson Goodwin	Lead Nurse, QEUH
Ms Natalie Marshall	Clinical Services Manager, North Sector
Dr David Mansouri	Clinical Lecturer, Glasgow University
Mrs Susan McFadyen	Interim General Manager
Mrs Tricia McKenna	Colorectal Nurse Endoscopist
Ms Gill Mitan	Administration Manager, North Sector
Dr Jude Morris	Consultant Physician and Gastroenterologist
Ms Eileen Murray	Staff Nurse, New VIC
Dr Kenneth O'Neill	Clinical Director, South Sector CHP
Mrs Lorna Reid	Lead Nurse, RAH
Mrs Rebecca Reid	Clinical Services Manager, RAH
Mrs Elizabeth Rennie	Programme Manager, Screening Dept
Dr Andrew Renwick	Consultant, RAH
Mrs Alana Struthers	CRUK Facilitator, West of Scotland
Mrs Ann Traquair-Smith	Clinical Services Manager, QEUH
Dr Jack Winter	Lead Clinician for Endoscopy (North)

Chapter 7 - Breast Screening Programme

Summary

Breast cancer is the most common cancer in women in Scotland accounting for 28.7% of all new cancers diagnosed in women. In 2016, 899 new breast cancers were registered among women residing in NHSGGC. In the same year, 222 women with a diagnosis of breast cancer died. Between 2006 and 2016, the age-standardised incidence rate of breast cancer in Scotland increased by 0.4%, however age-standardised mortality rate decreased by 18%.

The purpose of breast screening by mammography is to detect breast cancers early. It is believed that very early detection of breast cancers in this way can result in more effective treatment, which may reduce deaths from breast cancer. Women aged 50-70 years are invited for a routine screen once every three years. Women aged over 70 years are screened on patient request. The number of women eligible for breast screening in March 2018 was 160,904.

During 2015-2016, the Scottish Breast Screening Programme implemented a new Scottish Breast Screening System (SBSS) IT system. At the time of this report, data reporting was not possible from the SBSS system; therefore it was not possible to access any nationally validated annual statistics relating to breast screening uptake and outcomes. It is anticipated that reporting functionality will be in place in early 2019.

The West of Scotland Breast Screening Centre has optimised their appointing system, increasing the number of booked clients. Appointing figures have risen from approximately 8,000 screening slots per month to 10,000.

The Breast Screening Community Liaison Officer continued the engagement with communities and GP Practices, and has led promotional activities such as staff training, health road shows and community talks.

Chapter Contents

7.1. Background

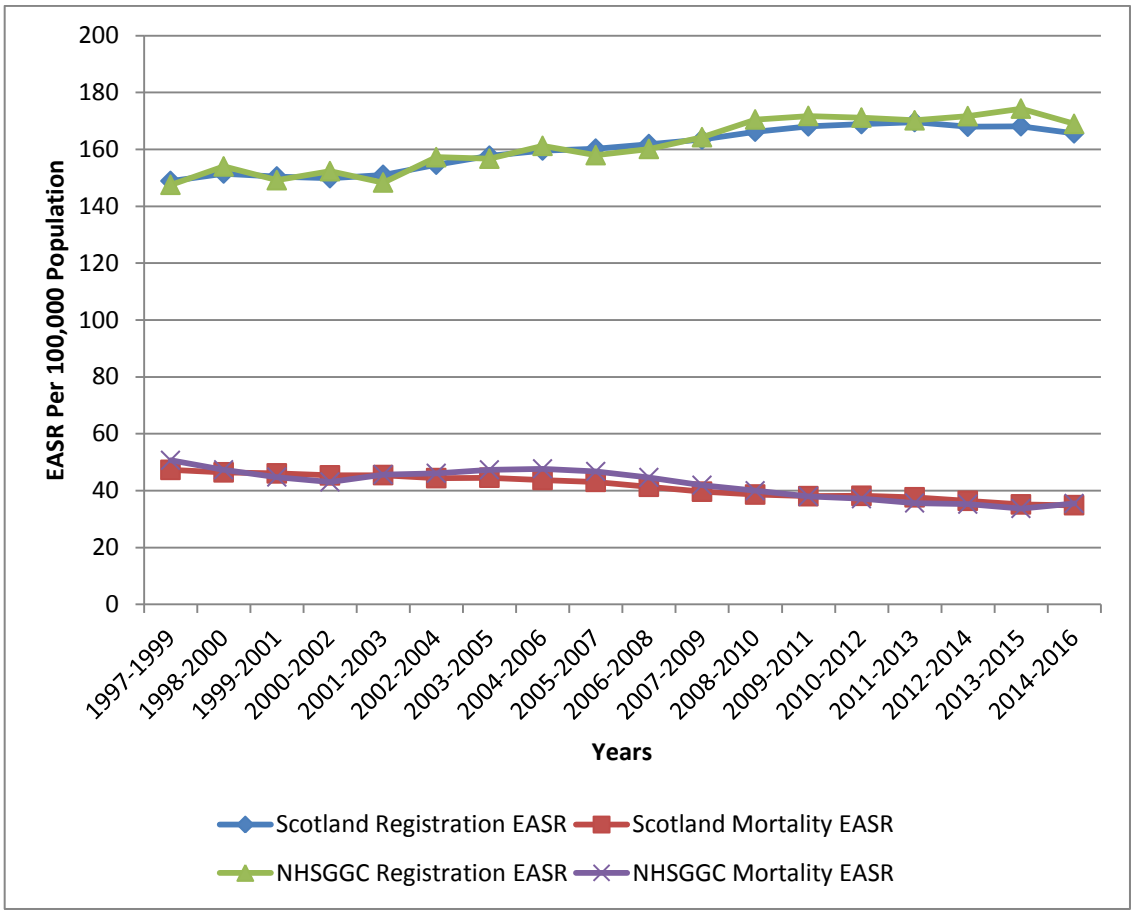
Breast cancer is the most common cancer in women in Scotland, accounting for 28.7% of all new cancers diagnosed in women[13].

In 2016, the most recent year for which completed data are available, 899 new breast cancers were registered among women residing in NHSGGC. This gives an age-standardised incidence rate of 153.4 per 100,000 per population, greater than the Scotland rate of 162.4 per 100,000. In the same year, 222 women with a diagnosis of breast cancer died in NHSGGC, giving a standardised mortality rate of 38 per 100,000 population. This is comparable with the Scotland rate of 35.6 per 100,000[14].

In the time period between 2006 and 2016, the age-standardised incidence rate of breast cancer in Scotland increased by 0.4%, however age-standardised mortality rate decreased by 18%. The increase in incidence of breast cancer is partly due to increased detection by the Scottish Breast Screening Programme and to changes in the prevalence of known risk factors, such as mother's age at birth of first child, smaller number of children, post-menopausal obesity and alcohol consumption[13]. Standardised incidence and mortality rates over rolling 3 year periods for breast cancer for NHSGGC and Scotland are illustrated in **Figure 7.1**.

[13] https://www.isdscotland.org/Health-Topics/Cancer/Publications/2018-04-24/2018-04-24-Cancer-Incidence-Report.pdf (accessed October 2018)
[14] http://www.isdscotland.org/Health-Topics/Cancer/Publications/2017-10-31/2017-10-31-Cancer-Mortality-Report.pdf (accessed October 2018)

Figure 7.1 Breast Cancer Registration Incidence and Mortality 1997-2016 (Rolling 3 Years) European Age Standardised Rate (EASR) Per 100,000 Population



Source: Registration Source: ISD April 2018, Mortality Source: ISD October 2017

7.2. Aim of Screening Programme

The Scottish Breast Screening Programme was introduced in February 1987 following the publication of the Forrest Report (1986). Breast screening was implemented in 1988 in North Glasgow, 1991 in South Glasgow and in October 1990 in Argyll & Clyde.

The purpose of breast screening by mammography is to detect breast cancers early. It is believed that very early detection of breast cancers in this way can result in more effective treatment, which may reduce deaths from breast cancer.

7.3. Eligible Population

Women aged 50 until age 70 years + 364 days are invited for a routine screen once every three years. Women aged over 70 years are screened on patient request.

7.4. The Screening Test and Pathway

The screening method used consists of two mammographic views. The test is a straightforward procedure involving two images being taken of each breast using an X-ray machine (also known as a mammogram).

The West of Scotland Breast Screening Centre screens NHSGGC residents in either the static centre in Glasgow or in mobile units that visit pre-established sites across the NHSGGC area.

Every woman registered with a GP receives her first invitation to attend for a mammogram at her local breast screening location sometime between her 50th and 53rd birthdays and then three yearly until age 70 + 364 days when women in her Practice are screened. A woman can request a screening appointment from the age of 50, however if her GP practice is being screened in the next six months she will be advised to attend there. The West of Scotland Breast Screening Centre also contacts all long-stay institutions (care homes, prisons, and mental health hospitals) to offer screening to eligible residents.

The mammograms taken during the screening visit are examined and the results sent to the woman and her GP. Women will be recalled if the mammogram was technically inadequate or will be asked to go to an assessment clinic for further tests if a potential abnormality has been detected. Tests may include further imaging, clinical examination and possibly ultrasound and biopsy if required.

If a woman is found to have cancer, she is referred to a consultant surgeon to discuss the options available to her. These usually involve surgery. This could be either a lumpectomy to remove the lump and a small amount of surrounding tissue or a mastectomy to remove the entire breast. Surgery is likely to be followed by radiotherapy, chemotherapy, hormone therapy or a combination of these.

The exact course of treatment will depend on the type of cancer found and the woman's personal preferences.

Assessment clinics are carried out in the West of Scotland Breast Screening Centre situated in Glasgow. The surgical treatment is carried out by designated teams in QEUH, New Victoria Hospital, New Stobhill Hospital and Royal Alexandra Hospital. A small proportion of women with palpable tumours are referred for treatment to local breast teams. **Figure 7.2** illustrates the breast screening pathway.

Figure 7.2 Breast screening Pathway

7.5. Delivery of Breast Screening Programme

The number of women eligible for breast screening in March 2018 was 160,904 **(Table 7.1).**

Table 7.1. NHSGGC residents eligible for breast screening programme (age 50-70) by HSCP area and age group, on 31st March 2018

	Age Group				
HSCP	**50-54 yrs**	**55-59 yrs**	**60-64 yrs**	**65-70 yrs**	**Total**
East Dunbartonshire	4,534	4,468	3,898	4,237	17,137
East Renfrewshire	3,893	3,534	3,163	3,348	13,938
Glasgow City - North East Sector	6,979	6,585	5,134	4,756	23,454
Glasgow City - North West Sector	7,135	6,555	5,382	4,938	24,010
Glasgow City - South Sector	8,465	8,126	6,747	5,890	29,228
Inverclyde	3,461	3,365	2,780	2,979	12,585
Renfrewshire	7,448	7,012	5,792	6,207	26,459
West Dunbartonshire	3,945	3,668	3,252	3,228	14,093
Total	**45,860**	**43,313**	**36,148**	**35,583**	**160,904**

Source: CHI August 2018

In NHSGGC in March 2018, 85.6% of women eligible for breast screening were from the White British category **(Table 7.2).** When added to those who are White Irish and White – any other background, white women made up 96% of the eligible population. The largest non-white ethnic group was Asian / Asian British which made up 2.1% of those eligible for screening.

Numbers of women eligible for screening were higher in the lowest age group where 28.5% of eligible women were aged 50-54. The number of eligible women gradually reduces as the age group increases.

Table 7.2. NHSGGC residents eligible for breast screening programme by ethnicity and age group, on 31st March 2018

	Age Group				
2001 Census ethnic group	**50-54 yrs**	**55-59 yrs**	**60-64 yrs**	**65-70 yrs**	**Total**
White - British	39,094	36,984	30,754	30,840	137,672
White - Irish	3,323	3,615	3,327	3,138	13,403
White - any other white background	1,229	957	738	531	3,455
Asian or Asian British - Indian	325	272	228	261	1,086
Asian or Asian British - Pakistani	746	622	447	300	2,115
Asian or Asian British - Bangladeshi	36	31	16	18	101
Asian or Asian British - Any Other Asian Background	29	14	10	5	58
Black or Black British – African /Caribbean*	114	73	45	44	276
Other ethnic groups - Chinese	298	278	232	147	955
Other ethnic groups - any other ethnic group	501	340	286	224	1,351
Unclassified	165	127	65	75	432
Total	**45,860**	**43,313**	**36,148**	**35,583**	**160,904**

*2 people in CARIBBEAN category
Source: CHI, ONOMAP August 2018

During 2015/2016, the Scottish Breast Screening Programme implemented a new Scottish Breast Screening System (SBSS) IT system. At the time of this report, data reporting was not possible from the SBSS system; therefore it was not possible to access any nationally validated annual statistics relating to breast screening uptake and outcomes. It is anticipated that reporting functionality will be in place in mid 2019.

In the absence of national validated data, the annual report of the West of Scotland Breast Screening Centre 2017[15] drew on activity information requested from ATOS. This allowed the Centre's management team to plan the scheduling of their mobile screening units. By monitoring slippage in the system, overbooking appointments, and being sensitive to local uptake rates, the available screening appointments have now been optimised. The changes made have had a significant effect on the number of booked clients. The

[15] West of Scotland Breast Screening Centre annual report, 2017 (accessed December 2017)

Centre now regularly has 10,000 screening slots per month where previously this figure was approximately 8,000.

There have been a number of developments in order to improve uptake of breast screening. The Community Liaison Officer appointed in 2004 is working in partnership with GPs, health improvement colleagues, and the community to improve understanding and uptake of the Screening Programme. This has included activities such as setting up information stands within health centre, shopping centres, leisure centres, bingo halls, libraries/learning centres and local community halls. Breast screening talks are presented to BME groups, carers groups, learning disability groups, low paid staff and mature students in local colleges. Before breast screening commences in the area, information packs are sent out to local companies and housing association. For local amenities with TV screens, slides are sent out for display and if appropriate, pop up stands are on display for the duration of screening. GP practices are provided with short scripts for their websites, newsletters and text messages, and if in possession of Community TV screens, slides are provided.

Added to this, there is ongoing review of the locations of the mobile screening units which has led to an increase in the number of appointments attended. Approval has also been granted to implement new telephony within the Centre which will enable SMS and telephone reminders.

7.6. Challenges and Future Priorities

- Application reporting is currently in development which will enable national validated data to be produced.
- Practice based calling that can lead to a women missing screening invitations remains a challenge.
- The increasing number of women eligible for screening presents a challenge.
- The development of a NHSGGC Inequalities Plan for Adult Screening programmes (Appendix A) will enable a more coordinated approach to reducing inequalities in uptake through targeted interventions.

Appendix 7.1
Members of Breast Screening Steering Group
(As at March 2018)

Dr Emilia Crighton	Deputy Director of Public Health (Chair)
Carol Beckwith	CRUK Facilitator, CRUK – West of Scotland
Celia Briffa-Watt	Public Health Specialist, NHS Lanarkshire
Sandra Cairney	Associate Director of Public Health, Argyll & Bute Health & Social Care Partnership
Margo Carmichael	Health Improvement Lead for Breast Screening, NHS Lanarkshire
Dr Marzi Davies	Director, WoSBSS
Dr Aileen Holliday	Clinical Effectiveness Coordinator, NHS Forth Valley
Marion Inglis	Administration Manager, WoSBSS
Heather Jarvie	Programme Manager, Health Services
Dr Graeme Marshall	Clinical Director, NE HSCP
Elaine Murray	Community Liaison Officer, WoSBSS,
Lorna Nimmo,	Superintendent Radiographer, WoSBSS,
Dr Tasmin Sommerfield	CPHM, NHS Lanarkshire
Janice Tannock	Superintendent Radiographer/Operational Manager, WoSBSS
Jean Wright	Assistant General Manger, Diagnostics

Chapter 8 - Cervical Screening

Summary

Cervical cancer was the eleventh most common cancer in females in 2016 in Scotland but also the most common cancer in women under the age of 35 years. In 2016, 66 new cervical cancers were registered among NHSGGC residents. This gives an age-standardised incidence rate of 10.4 per 100,000 population, comparable to the Scotland rate of 12.3 per 100,000. In the same year, 21 women who had a diagnosis of cervical cancer died in NHSGGC, giving a standardised mortality rate of 3.6 per 100,000 population lower than the Scotland rate of 3.8 per 100,000.

The aim of the Scottish Cervical Screening Programme (SCSP) is to reduce the number of women who develop invasive cancer and the number of women who die from it by detecting precancerous changes. Women aged 25-49 are offered screening every three years and women aged 50-64 are offered screening every five years. Women who were already enrolled in the screening programme aged less than 25 will continue to be screened every three years until they are 50.

Uptake in NHSGGC for 2017-2018 was 71.9% against a target of 80%, a total of 329,796 women being adequately screened within the specified period. Uptake is poorest among women aged between 25-29 (62.7%), women with learning disabilities (29.2%), and among women from ethnic minorities (for Chinese women it was 36.7%). Uptake for women living in the least deprived areas was 76.9% compared with 69.3% in the most deprived areas however there is not a clear trend across socio-economic groups. The lower uptake rates in some HSCPs are not wholly explained by socio-economic deprivation.

Queen Elizabeth University Hospital processes all smear test specimens for NHSGGC and in 2017-18 processed 96,174 cervical screening tests. Of all tests processed 97.1.0% were of satisfactory quality i.e. there were enough cells in the sample. Of the satisfactory quality tests 90.5% had a negative (normal) result, 8.3% had a low grade cell change and the remaining 1.2% had high grade cell changes.

NHSGGC has carried out a multi-disciplinary review of all invasive cervical cancer cases since 2006 to audit the screening and management of every case. In 2017, 36% of all invasive cervical cancers in were screen detected.

A new approach to cervical screening has been approved by the Scottish Government and will be introduced in early 2020. High risk HPV screening involves the same clinical examination (a cervical smear) but only women whose virology results are positive for specific types of Human Papilloma Virus will have cervical cytology.

In response to an NHSGGC internal audit of the Cervical Screening Programme, clear mechanisms have been established to use data to target promotional activities to vulnerable or excluded groups.

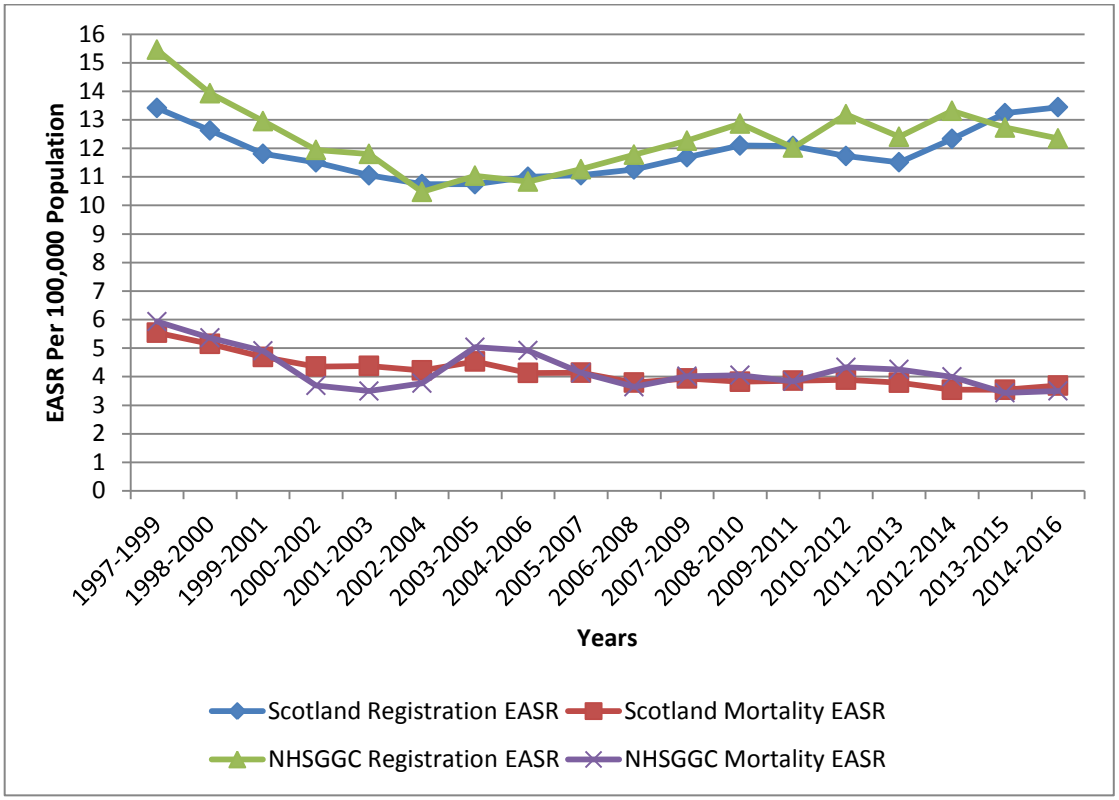
Chapter Contents

8.1. Background

Cervical cancer was the eleventh most common cancer in females in 2016 in Scotland and most common cancer in women under the age of 35 years[16]. In 2016, the most recent year for which completed data is available[17], 66 new cervical cancers (cancer of the cervix uteri) were registered among NHSGGC residents. This gives an age-standardised incidence rate of 10.4 per 100,000 population, comparable to the Scotland rate of 12.3 per 100,000. In the same year, 21 women with a diagnosis of cervical cancer died, giving a standardised mortality rate of 3.6 per 100,000 population lower than the Scotland rate of 3.8 per 100,000.

Standardised incidence and mortality rates over rolling 3 year periods for cervical cancer for NHSGGC and Scotland are illustrated in **Figure 8.1**.

Figure 8.1 Cervical Cancer Registration & Mortality 1997-2016 (Rolling 3 Years) European Age Standardised Rate (EASR) Per 100,000 Population



Registration Source: ISD April 2018, Mortality Source ISD October 2017

[16] http://www.isdscotland.org/Health-Topics/Cancer/Publications/2018-04-24/Cancer_in_Scotland_summary_m.pdf (accessed October 2018)
[17] http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics/Female-Genital-Organ/#cervix (accessed October 2018)

8.2. Risk Factors

Most cervical cancers are caused by oncogenic types of human papilloma virus (HPV), mainly types 16 and 18. While the majority of women clear the HPV virus, a minority have persistent HPV infection which can transform normal cervical cells into abnormal ones. These changes can occur over a period of 10 to 20 years through precancerous lesions to invasive cancer and death.

Other risk factors for cervical cancer include factors which increase exposure to the virus (such as having a high number of sexual partners), factors that make your body more vulnerable to infection or affect immune response (including HIV), and smoking.

8.3. Aim of Screening Programme and Eligible Population

The aim of the Scottish Cervical Screening Programme (SCSP) is to reduce the number of women who develop invasive cancer and the number of women who die from it by detecting precancerous changes. By taking a cytological smear from the cervix, followed where necessary by a diagnostic test, it is possible to identify changes in individual cells which may mean that the woman is at risk of developing invasive cancer at a later date. Prompt treatment can result in permanent removal of affected areas of the cervix and prevent the development of cancer.

Women who live in the Greater Glasgow and Clyde area and who have a cervix are invited for screening. Until June 2016, women aged 20 to 60 were invited every three years. From June 6th 2016, a Change in Age Range and Frequency (CARAF) was made to reflect new evidence about the effectiveness of screening. The CARAF means that women aged 25-49 are offered screening every three years and women aged 50-64 are offered screening every five years. Women aged less than 25 who were already enrolled in the screening programme will continue to be screened every three years until they are 50.

8.4. Programme Monitoring

The national cervical screening programme delivery and quality is monitored against key programme statistics[18] and National Cervical Screening Standards[19].

[18] https://www.isdscotland.org/Health-Topics/Cancer/Publications/2018-09-04/2018-09-04-Cervical-Screening-Report.pdf (accessed October 2018)

[19] http://www.healthcareimprovementscotland.org/previous_resources/standards/cervical_screening.aspx (accessed October 2018)

The uptake of cervical screening is monitored using two different methods to define the eligible population:

i) National and Health Board level uptake: this method identifies all women in the Health Board area in the eligible age groups minus those who have no cervix (for example, following a total or radical hysterectomy).

ii) General Medical Services (GMS) uptake: this method is used to calculate payments to GP Practices, and includes several other exclusions such as repeated non-attendance ("patients who have been recorded as refusing to attend review who have been invited on at least three occasions during the preceding 12 months").

8.5. The Screening Test and Pathway

A "smear test" involves collecting cells from the surface of the cervix or 'neck of the womb'.

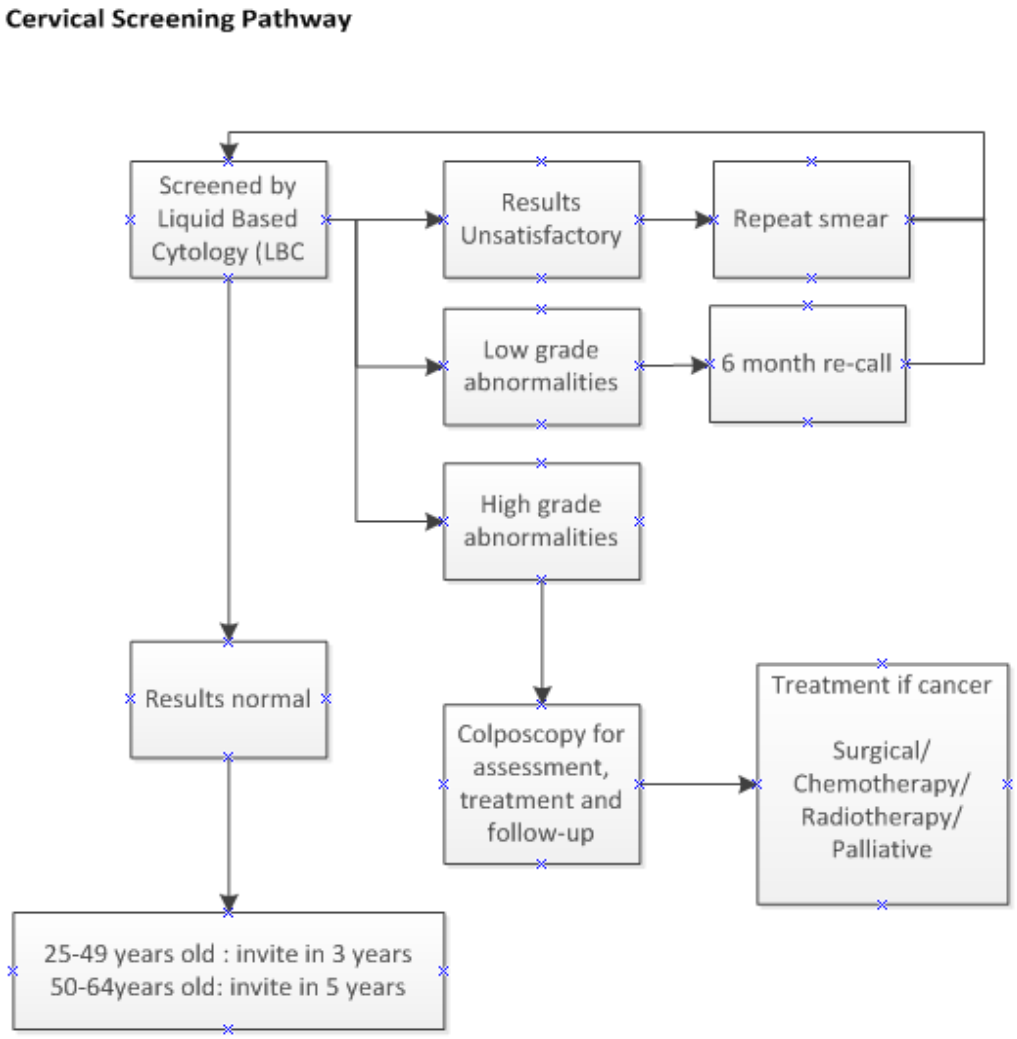
Liquid based cytology (LBC) is a way of preparing cervical samples for examination in the laboratory. The sample is collected using a special device which brushes cells from the neck of the womb. The head of the brush, where the cells are lodged, is broken off into a small plastic vial containing preservative fluid, or rinsed directly into the preservative fluid.

The sample is sent to the laboratory where it is spun and treated to remove obscuring material, for example mucus or pus and a random sample of the remaining cells is taken. A thin layer of the cells is deposited onto a slide. The slide is then screened automatically and if there is evidence of any abnormality, examined under a microscope by a cytologist.

Figure 8.2 illustrates the pathway for the cervical screening programme. Following the invitation being issued, a woman will make an appointment to attend for a test.

Women can also have opportunistic smears at the time of attending medical care for another reason. Depending on the result of the test she will be recalled to attend, if eligible, in three years (normal result, aged 25-49) or five years (normal results, aged 50-64), six months (for a borderline result and low grade results); will have a repeat smear (if result not satisfactory) or will be referred to colposcopy for diagnostic tests and treatment **(Appendix 8.1).** Treatment of invasive cervical cancers follows agreed cancer treatment pathways.

Figure 8.2 Cervical screening pathway



The Scottish Cervical Call Recall System (SCCRS) provides women with a complete e-health record detailing their whole smear history which professionals involved with the screening programme access. Results are automatically available for the smear takers to view in SCCRS and patients are sent notification directly from Scottish Cervical Call Recall System. The system also produces individual, and practice performance automated reports.

The National Colposcopy Clinical Information Audit System (NCCIAS) is used by colposcopy staff for the clinical management and audit of all colposcopy referrals.

A new approach to cervical screening has been approved by the Scottish Government and will be introduced in early 2020. High risk HPV screening involves the same clinical examination (a cervical smear) but only women whose virology results are positive for specific types of Human Papilloma Virus will have cervical cytology.

8.6. HPV Vaccination

Since 2008, all girls aged 11 to 13 years in their second year of secondary school are routinely offered vaccinations to protect them against the Human Papilloma Virus (HPV).

The purpose of the HPV immunisation programme is to protect girls from the two types of HPV that cause around 75% of cases of cervical cancer. The HPV vaccine does not protect against all cervical cancers, so regular cervical screening is still important.

In the school year of 2017/18, vaccination uptake amongst S1 girls in NHSGGC was 90.8% (1st dose) and 87.1% in S2 girls (1st dose). The uptake for girls in S3 is shown below in **Table 8.1**.

Table 8.1 HPV immunisation uptake rates by the end of the school year 2017/18 by NHS Board of school girls in S3

NHS Board of school	Number eligible	Dose 1		Dose 2	
		Number immunised	% Uptake	Number immunised	*% Uptake*
Ayrshire & Arran	1,821	1,691	92.9	1,620	89.0
Borders	557	521	93.5	498	89.4
Dumfries & Galloway	739	701	94.9	659	89.2
Fife	1,878	1,649	87.8	1,485	79.1
Forth Valley	1,641	1,550	94.5	1,455	88.7
Grampian	2,716	2,472	91.0	2,368	87.2
Greater Glasgow & Clyde	**5,587**	**5,275**	**94.4**	**5,092**	**91.1**
Highland	1,591	1,382	86.9	1,283	80.6
Lanarkshire	3,486	3,215	92.2	3,074	88.2
Lothian	4,128	3,715	90.0	3,418	82.8
Orkney	99	89	89.9	85	85.9
Shetland	112	99	88.4	96	85.7
Tayside	2,115	1,934	91.4	1,816	85.9
Western Isles	145	130	89.7	109	75.2
Scotland	**26,615**	**24,423**	**91.8**	**23,058**	**86.6**

Source: CHSP School/SIRS
https://www.isdscotland.org/Health-Topics/Child-Health/Publications/2018-11-27/2018-11-27-HPV-Report.pdf (accessed December 2018)

8.7. General Medical Services (GMS) Delivery of Cervical Screening

The GMS contract introduced in 2004 included cervical screening in the additional services domain and awarded practices for providing the service under the Quality and Outcomes Framework (QOF). QOF was disbanded in 2016/17 and payment to practices continued based on their previous three year average achievement. There were previously two parts to the payments.

The first was QOF, which remunerated practices for having a protocol for the management of screening, carrying out the screening test and reaching a target and auditing their inadequate smears. This payment is now included in GP Practices' 'Global Sum'.

The second was 'Additional Services' which remunerated practices for:

- The provision of any necessary information and advice to assist women identified by the Health Board as recommended nationally for a cervical screening test in making an informed decision as to participation in the NHS Scotland Cervical Screening Programme;
- The performance of screening tests on women who have agreed to participate in the Programme;
- Arranging for women to be informed of the results of the test; and
- Ensuring the test results are followed up appropriately

'Additional Services' remains part of the new contract, however and if GP Practices chose to "opt out" of delivering this their 'Global Sum' would be reduced by 0.84%.

Previously, the GMS cervical screening indicator was based on the percentage of women who had a cervical smear performed in the last 5 years. Points were awarded on a sliding scale to encourage GP practices continue to maintain high levels of uptake in cervical screening. The contract allowed GP practices to exception-report (exclude) specific patients from data collected to calculate achievement scores, therefore not penalising GP practices where exception reporting occurs. **Table 8.2** outlines the reasons and number of eligible women with a GMS exclusion from cervical screening in the 2017/18 contract year.

Table 8.2 Number and proportion of women excluded from GMS cervical screening programme by exclusion category, 2017/18

GP list size: Number of eligible women		**329,796**
Exclusion reason	**Number**	***%***
Defaulter	78,918	79.77
No Cervix	15,471	15.64
Opted Out	3,203	3.24
Pregnant	519	0.52
Not Clinically Appropriate	489	0.49
No Further Recall	281	0.28
Co-morbidity	27	0.03
Anatomically Impossible	22	0.02
Terminally Ill	7	0.01
Total	**98,937**	**100.0**
% of eligible women with exclusion applied		***29.9***

Source: SCCRS (August 2018)

During 2017/18 contract year, there were 329,796 women aged 25 to 64 years residing in NHSGGC area and registered with an NHSGGC GP practice. Of these, 29.9% (98,937) had a GMS exclusion applied. The highest proportion of those excluded under GMS exception reporting was classified as Defaulters (79.8%), having not responded after three invitations sent. GMS cervical screening activity is monitored quarterly, in relation to uptake, unsatisfactory smear rates and percentage of defaulters **(Table 8.3)**.

Figure 8.3 shows uptake by individual GP Practice against the National KPI target of 80%. The majority of Practices did not achieve the target figure.

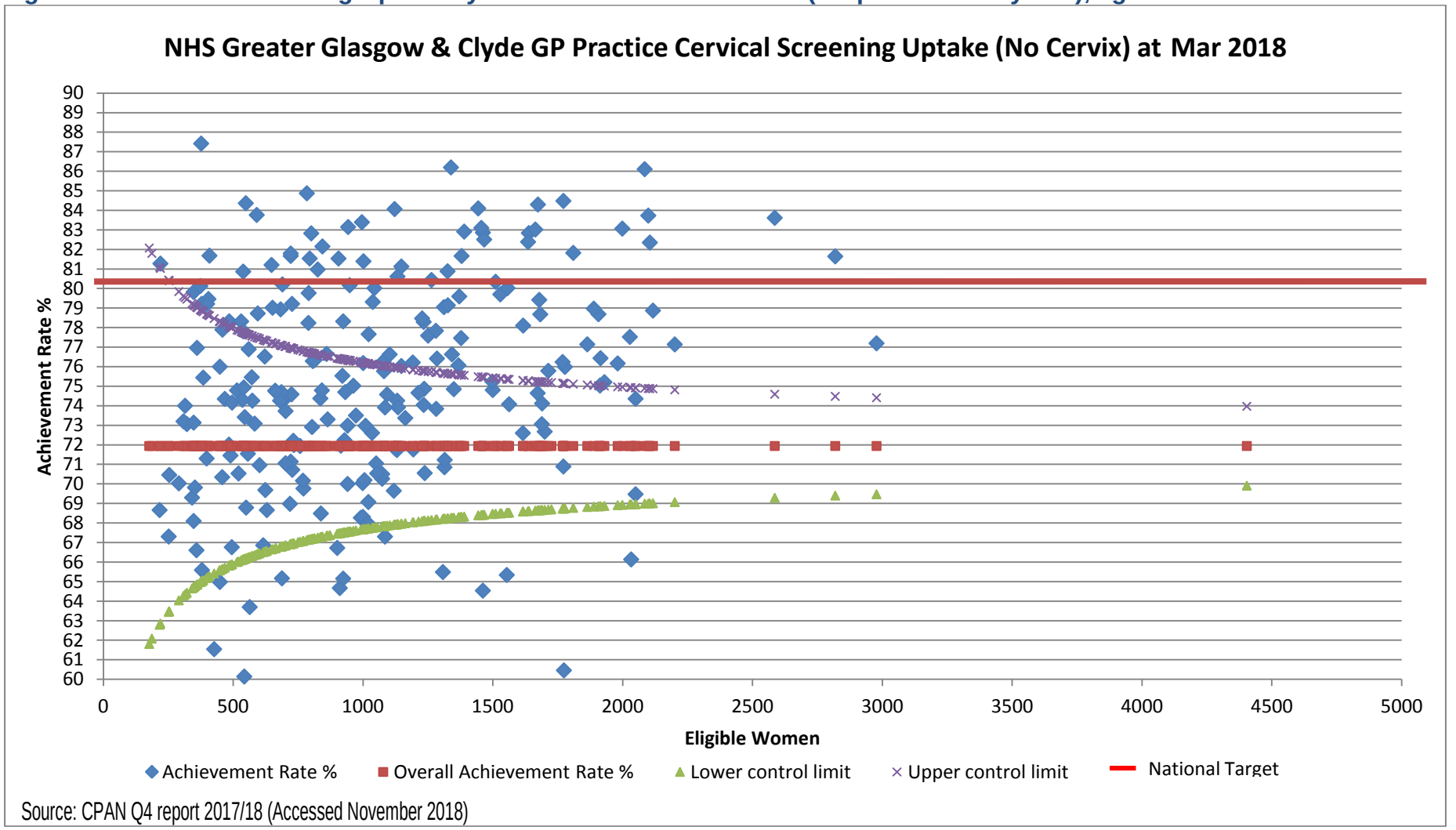
Table 8.3 No Cervix uptake rates, GMS uptake rates, unsatisfactory smear rates and percentage of defaulters by HSCP in 2017/18

HSCP	No Cervix Uptake					GMS Contract Uptake					% Unsatisfactory					% Defaulters (of List Size)				
	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18
East Dunbarton-shire	82.1	82	81.8	81.8	81.8	91.5	91.8	93.2	93.5	93.4	2.5	2.7	2.5	2.7	2.5	14.7	14.9	16.6	16.7	16.7
East Renfrew-shire	81.1	81	80.8	80.6	80.6	90.9	91.8	92.9	93.4	93.2	2.8	2.2	2.7	2.4	2.6	15.2	16.3	17.8	18.1	18.0
Glasgow North East	73.1	72.8	72.5	72.3	72.3	86.8	87.1	88	87.4	87.4	2.8	2.4	2.2	2.2	2.4	22.2	26.1	23.9	23.5	23.6
Glasgow North West	66.4	65.7	65	65.4	65.3	82.6	83	84.8	85.1	84.9	3.1	2.2	2.1	2.7	2.2	25.3	26.1	28.6	28.1	28.1
Glasgow South	73.6	73.3	73	73.0	72.9	86.7	87.4	88.7	88.8	88.9	2.3	2.4	2.8	2.2	2.9	20.5	21.1	22.7	22.7	23.0
Inverclyde	75.3	75	75	75.0	75.0	88.0	89.2	90.4	90.8	90.6	2.9	3.6	1.8	3.5	3.6	20.7	21.3	22.8	22.9	22.8
Other[1]	55.6	52.2	64	66.7	69.0	68.4	64.3	76.5	80.0	75.0	0.0	0.0	0.0	0.0	0.0	29.6	39.1	32	37.5	31.0
Renfrew-shire	78.4	78	77.8	77.8	77.8	90.1	90.6	91.5	91.8	91.6	2.8	2.3	1.9	2.3	2.6	17.8	18.3	19.6	19.9	19.8
West Dunbarton-shire	77.0	76.6	76.3	76.2	76.0	89.3	89.8	90.9	91.4	90.6	2.7	2.5	3.1	3.1	3.2	19.5	20.2	21.8	22.2	21.5
GGC	**74.3**	**73.9**	**73.5**	**73.6**	**73.5**	**87.4**	**88.0**	**89.2**	**89.4**	**89.2**	**2.7**	**2.4**	**2.4**	**2.5**	**2.7**	**20.5**	**21.0**	**22.8**	**22.7**	**22.7**

[1] Other = Challenging Behaviour, Nursing Homes Practice, Homelessness Unit; High percentages are due to small numbers

Source: SCCRS (August 2018)

Figure 8.3 Cervical Screening Uptake by GP Practice at March 2018 (for previous 5.5 years), against National KPI



Source: CPAN Q4 report 2017/18 (Accessed November 2018)

8.8. Programme Performance and Delivery

National cervical screening programme statistics cover information on uptake of screening, results of screening, quality of laboratory and colposcopy, and cancer diagnosis. The statistics are reported for a one year period. **Appendix 8.2** provides a summary of NHSGGC activity against these national statistics for the time period 1st April 2017 and 31st March 2018.

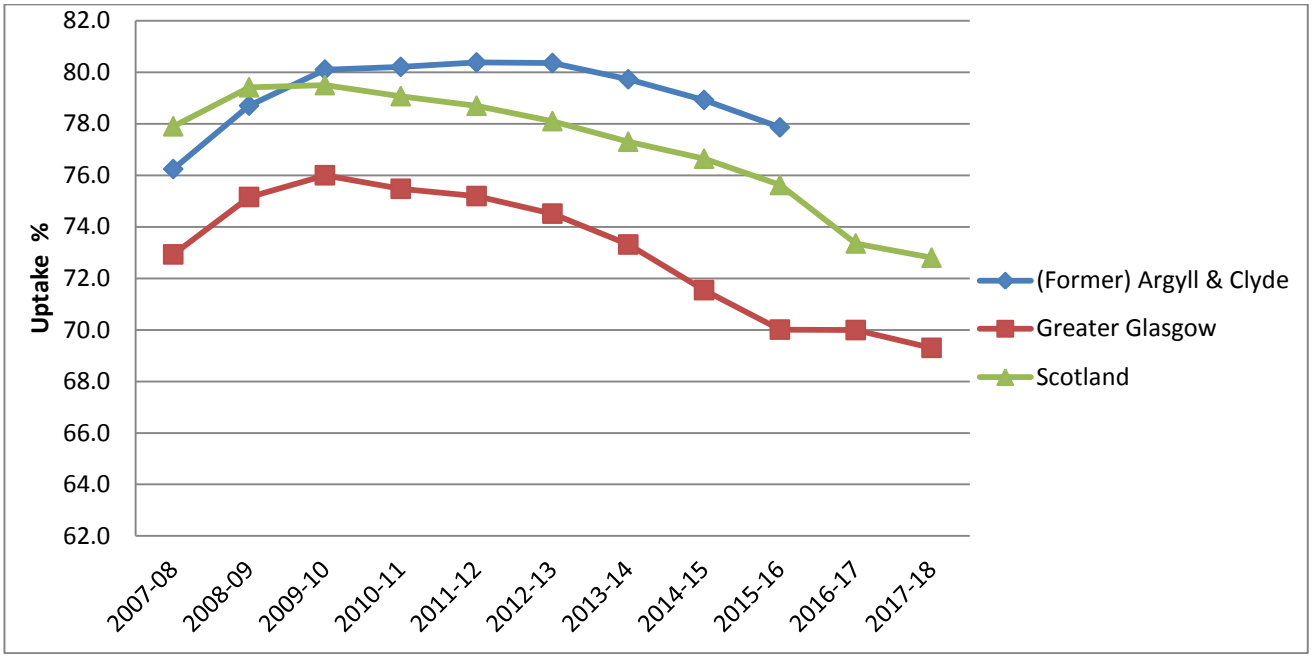
National and Health Board level uptake is based on all women in the Health Board area in the eligible age groups, minus those who have no cervix (for example, following a total or radical hysterectomy).

Uptake is age-appropriate, based on being screened within the specified period (within last 3.5 or 5.5 years).

Please note that these figures have been produced from a data extract from the SCCRS system in August 2018, therefore figures may differ from those quoted in national statistics **(Appendix 8.2).**

There has been a decline over time in uptake of cervical screening in Scotland and NHS Greater Glasgow and Clyde, and since 2012 the overall uptake target of 80% has not been reached nationally **(Figure 8.4).**

Figure 8.4 Uptake rate of cervical screening in NHSGGC and Scotland by year (2007-2018)



Source: SCCRs population denominator (excluding medically ineligible women)
* 2007-16 data are based on the pre-2006 Health Board configuration (former Argyll & Clyde); Greater Glasgow figures do not include the Clyde area. 2016-18 figures for NHS Greater Glasgow now include the Clyde area.

Younger women have a poorer uptake of cervical screening than older women **(Table 8.4).** Among women aged 25 to 29, the uptake rate was 62.7% compared to women aged over 40, whose uptake rate was 74.0%. The CARAF might lead to an improvement in overall uptake rates but no age group achieves the 80% target uptake.

Table 8.4 Uptake of cervical screening among eligible population by age for NHS Greater Glasgow and Clyde, 2017-18 in previous 5.5 years

Age Group	Not Screened	Screened	Total	*% Uptake*
25-29	16,450	27,708	44,158	*62.7*
30-34	14,959	35,284	50,243	*70.2*
35-39	11,815	33,158	44,973	*73.7*
40-44	8,832	27,901	36,733	*76.0*
45-49	9,256	31,169	40,425	*77.1*
50-54	10,225	32,211	42,436	*75.9*
55-59	10,901	28,483	39,384	*72.3*
60-64	10,365	21,079	31,444	*67.0*
Total	**92,803**	**236,993**	**329,796**	***71.9***

Chi-Square Tests Linear-by-Linear Association p < 0.0001
Source: SCCRS (August 2018)

Uptake was higher in areas of lower deprivation. Uptake for women aged 25 to 64 in the least deprived areas was 76.9% compared with 69.3% in the most deprived areas. The target of 80% was not met in any deprivation quintile **(Table 8.5).**

Table 8.5 Uptake of cervical screening among eligible population by SIMD for NHS Greater Glasgow and Clyde, 2017-18 in previous 5.5 years

SIMD Quintile 2016	Not Screened	Screened	Total	*% Uptake*
1 (Most Deprived)	36,619	82,517	119,136	*69.3*
2	15,186	40,026	55,212	*72.5*
3	13,881	32,786	46,667	*70.3*
4	12,739	33,776	46,515	*72.6*
5 (Least Deprived)	14,378	47,888	62,266	*76.9*
Total	**92,803**	**23,6993**	**329,796**	***71.9***

Source: SCCRS (August 2018)
Chi-Square Tests Linear-by-Linear Association p < 0.0001

There was a large variation in uptake across the different ethnic groups **(Table 8.6).** The highest uptake was among White – British ethnic category at 76.0%, and the lowest uptake of 36.7% was among Chinese women.

Table 8.6 Uptake of cervical screening among eligible population by ethnicity for NHS Greater Glasgow and Clyde, 2017-18 in previous 5.5 years

2001 Census Ethnic Group	Not Screened	Screened	Total	% Screened
White – British	60,857	192,769	253,626	*76.0*
White – Irish	5,602	15,444	21,046	*73.4*
White - any other white background	8,926	10,236	19,162	*53.4*
Asian or Asian British	6,040	8,722	14,762	*59.1*
Black or Black British	1,075	1,482	2,557	*57.9*
Other ethnic groups - Chinese	4,860	2,816	7,676	*36.7*
Other ethnic groups - any other group	3,169	3,810	6,979	*54.6*
Unclassified	2,274	1,714	3,988	*43.0*
Total	**92,803**	**236,993**	**329,796**	***71.9***

Source: SCCRS (August 2018); OnoMap

The target for cervical screening uptake (80%) was met only in East Dunbartonshire HSCP. The lowest uptake rate of 62.7% was in Glasgow City HSCP North West Sector, a difference in uptake of 18.1**% (Table 8.7).**

However, when the known effects of deprivation and ethnicity are taken into account by standardisation (Standardised Uptake Rate – SUR), the variation in uptake across HSCPs is reduced, however a significant difference remains (9.9% difference between highest and lowest), with 75.6.% SUR in East Dunbartonshire HSCP compared to 65.8% SUR in Glasgow City HSCP – North West Sector. This tells us that there are local practices that explain the variation in addition to the population demographics.

Table 8.7 Indirectly Standardised Uptake of Cervical Screening by HSCP in NHS Greater Glasgow and Clyde, 2017-18

HSCP	Not Screened	Screened	Total	% *Screened*	SUR %	SUR % LCI	SUR % UCI
East Dunbartonshire	5,480	22,991	28,471	*80.8*	***75.6***	*74.6*	*76.6*
East Renfrewshire	4,887	19,389	24,276	*79.9*	***75.1***	*74.1*	*76.2*
Glasgow North East Sector	16,254	36,707	52,961	*69.3*	***71.4***	*70.7*	*72.2*
Glasgow North West Sector	24,628	41,355	65,983	*62.7*	***65.8***	*65.2*	*66.5*
Glasgow South Sector	19,460	47,012	66,472	*70.7*	***72.2***	*71.5*	*72.8*
Glasgow City	*60,342*	*125,074*	*185,416*	*67.5*	***69.7***	*69.4*	*70.1*
Inverclyde	5,274	15,345	20,619	*74.4*	***72.6***	*71.4*	*73.7*
Renfrewshire	10,764	35,794	46,558	*76.9*	***74.2***	*73.5*	*75.0*
West Dunbartonshire	6,056	18,400	24,456	*75.2*	***74.0***	*72.9*	*75.1*
Total	**92,803**	**236,993**	**329,796**	***71.9***			

Source: SCCRS (August 2018), OnoMap.
SUR = Standardised Uptake Rate; UCI = Upper Confidence Intervals; LCI = Lower Confidence Intervals

To enable further local analysis of uptake rates, geographical mapping at data-zone level has been carried out. This illustrates that uptake rates in some pockets of NHSGGC can be surprisingly low. Against a population target of 80%, 111 of the 1456 data zones did not achieve 60% uptake, 24 of which were below 40%. Data zone maps for NHSGGC and by HSCP are available on the PHSU website[20].

Of those eligible for cervical screening, 1,848 were registered as having a Learning Disability (LD) **(Table 8.8)**. Women who were registered with a learning disability had poorer uptake of cervical screening. It was 29.2% compared to 72.1% in the rest of the population.

[20] Cervical Screening Uptake Data Zone maps: https://www.nhsggc.org.uk/your-health/public-health/public-health-screening-unit/reports/

Table 8.8 Uptake of cervical screening among eligible population with learning disability for NHS Greater Glasgow and Clyde 2017-18, in previous 5.5 years

Learning Disability	Not Screened	Screened	Total	*% Uptake*
Rest of population	91,495	236,453	327,948	*72.1*
Registered with a LD	1,308	540	1,848	*29.2*
Total	92,803	236,993	329,796	*71.9*

Source: SCCRS ; Learning Disability Register (August 2018)
Pearson Chi-Square p < 0.0001

People registered on PsyCIS have had at least one episode of psychosis which is typically seen in patients with a severe or enduring mental illness. These individuals had poorer uptake of screening **(Table 8.9)**. It was 68% compared to 71.9% in the rest of the population.

Table 8.9 Uptake of screening among eligible population among people with severe and enduring mental illness for NHS Greater Glasgow and Clyde 2017-18, in previous 5.5 years

Severe and Enduring Mental Illness	Not Screened	Attended Screening	Total	*% Uptake*
Rest of population	91,977	235,237	327,214	*71.9*
Registered on PsyCIS	826	1,756	2,582	*68.0*
Total	92,803	236,993	329,796	*71.9*

Source: SCCRS ; PSYCIS (August 2018)
Pearson Chi-Square p < 0.0001

8.9. NHSGGC Cytopathology Laboratories

Table 8.10 provides an overview of the number of cervical screening tests processed and the results of cervical screening tests carried out at NHSGGC laboratory for the period 1st April 2017 to 31st March 2018. This data is sourced from nationally produced annual reports from SCCRS Laboratory Report and so may differ from nationally reported data.

The total number of smear tests processed in NHSGGC laboratory in 2017/18 was 96,216. An essential criterion of the NHS HIS standards requires the laboratories to process a minimum of 15,000 smears annually and this has been achieved. These included repeat smears and smears taken at colposcopy as one woman can have more than one smear test.

Of the 96,216 cervical samples processed, 2,796 (2.91%) were reported as unsatisfactory smears. Quarterly comparative performance is fed-back to

individual smear takers based on the proportion of unsatisfactory smears reported. The unsatisfactory smear rate in 2017/18 (2.9%) was similar to other years in the past decade.

Of the 96,174 smears tests received by the laboratories, 93,420 (97%) were satisfactory and processed. Of these 93,420 smears tests, 84,564 (90.5%) were reported to be negative (normal).

In 2017/18, 8,843 (9.5%) of satisfactory smears were reported as abnormal compared to 10.1% in the previous year. Abnormal smears results include: borderline, mild, moderate and severe dyskaryosis, severe and invasive dyskaryosis, glandular abnormality and adenocarcinoma. Of the Abnormal smears, 8.3% had a low grade cell change and the remaining 1.2% had high grade cell changes. **Appendix 8.1** shows the management and follow up advice for cytology results.

The introduction of High risk HPV screening in early 2020 will impact the workload of the NHSGGC Cytopathology laboratories. The Glasgow laboratory will be one of the two laboratories that will deliver the new pathway. Planning is underway at national, Board, and local team levels to enable a smooth transition.

Table 8.10 Cervical screening tests processed and results of cervical screening tests carried out at NHSGGC Laboratory: 1st April 2017 – 31st March 2018

All screens	Unsatis-factory screens	**Total**	**Result of satisfactory screens**									
			Negative	**Borderline**		**Dyskaryosis**				Glandular abnormality	Endocervical Adeno-carcinoma	Endometrial or other malignancy
				Change in endocervical cells	Change in squamous cells	Low grade	High grade (moderate)	High grade (severe)	High grade dyskaryosis invasive			
96,216	2,796 *(2.9%)*	**93,420**	84,564 (90.5%)	140 *(0.2%)*	3,801 *(4.1%)*	3,821 *(4.1%)*	635 *(0.7%)*	380 *(0.4%)*	14 *(0.0%)*	50 *(0.1%)*	0 (0.0%)	13 *(0.0%)*

Source: Lab003 reporting system, accessed November 2018

8.10. Colposcopy

Table 8.11 shows the activity data across NHSGGC colposcopy services. In 2017/18, there were 6,487 patient episodes. New outpatient episodes include all patients attending colposcopy services; return episodes will include treatment visits following the diagnosis of cervical intra-epithelial neoplasia (CIN) in addition to standard follow up visits for colposcopy based indications.

Table 8.11 NHSGGC Colposcopy Services Workload 1 April 2017 to 31 March 2018

Attendance Status	Type of Episode			Total Episodes (Types 1-3)
	New Outpatients	Return/ Follow Up Outpatients	Inpatients	
Patient was Seen (Attended)	4,039	2,404	44	6,487
Cancelled by Patient	271	286	0	557
Cancelled by Clinic or Hospital	37	137	0	174
Patient attended but was not seen (CNW)	6	≤5	0	10
Patient Did Not Attend	451	490	0	941

Source: National Colposcopy Clinical Audit System (Extracted November 2018)
Numbers ≤5 redacted as per ISD Statistical Disclosure Control Protocol

The Clinical Standards for Cervical Screening, published in 2002 by the Clinical Standards Board for Scotland, have been identified for review. Healthcare Improvement Scotland has published draft standards[21] that set out nationally agreed time frames for individuals to be seen within. Those who are referred to the colposcopy service with an abnormal screening test should be seen:

- no later than 2 weeks for urgent referrals (glandular, suspicion of invasion)
- no later than 4 weeks for high grade referral, and
- no later than 8 weeks for low grade referrals that do not require urgent assessment.

Table 8.12 presents the waiting times of patients referred to NHSGGC colposcopy services. For patients who are identified as having high grade

[21] http://www.healthcareimprovementscotland.org/our_work/cancer_care_improvement/programme_resources/cervical_screening_standards.aspx [Accessed 28th December 2018]

abnormalities, most women were seen within the timeframe with only 56 women (11%) waiting more than 4 weeks.

Table 8.12: Referrals to Colposcopy by Time Waited from Referral to First Appointment by Referral Cytology or Reason for Referral

	New Referrals by Time Waited from Referral to First Appointment						
	Less than or equal to 4 weeks (a)		Greater than 4 weeks and <= 8 weeks (b)		Greater than 8 weeks (c)		Total New Referrals
Referral Cytology	**No.**	**%**	**No.**	**%**	**No.**	**%**	**(a + b + c)**
Unsatisfactory	14	18.92	36	48.65	24	32.43	74
Borderline change in squamous cells	58	11.37	296	58.04	156	30.59	510
Low grade dyskaryosis	141	12.02	641	54.65	391	33.33	1,173
Borderline change in endocervical cells	5	17.86	18	64.29	5	17.86	28
High grade dyskaryosis (moderate)	499	90.07	39	7.04	16	2.89	554
High grade dyskaryosis (severe)	333	93.54	17	4.78	6	1.69	356
High grade dyskaryosis? Invasive	9	100	0	0	0	0	9
Glandular Abnormality	35	100	0	0	0	0	35
Endocervical Adenocarcinoma	1	100	0	0	0	0	1
Endometrial or other malignancy	6	100	0	0	0	0	6
No Referral Cytology							
Clinical Indication	270	46.40	191	32.82	121	20.79	582
Other	214	21.10	487	48.03	313	30.87	1,014
Total	**1585**	**36.50**	**1725**	**39.73**	**1032**	**23.77**	**4,342**

Source: NHSGGC local waiting times reports amalgamated, Extracted Nov 2018

8.11. Invasive Cervical Cancer Audit

The aim of the cervical screening programme is to reduce the incidence of and mortality from invasive cervical cancer. It is recognised that in order to assess the effectiveness of the cervical screening programme, the audit of the screening histories of women with invasive cervical cancer is fundamental. This audit is an important process that helps to identify variations in practice, encourages examinations of the reasons for these variations, and helps to identify the changes required to improve the quality of the service.

In 2017, we reviewed the notes of 55 women who developed invasive cervical cancer and had a pathology diagnosis made in NHS Greater Glasgow and Clyde laboratories.

Table 8.13 shows numbers and the distribution of women's age at diagnosis for years 2010 to 2017. The largest number of cervical cancers occurred in women aged between 30 and 39 years.

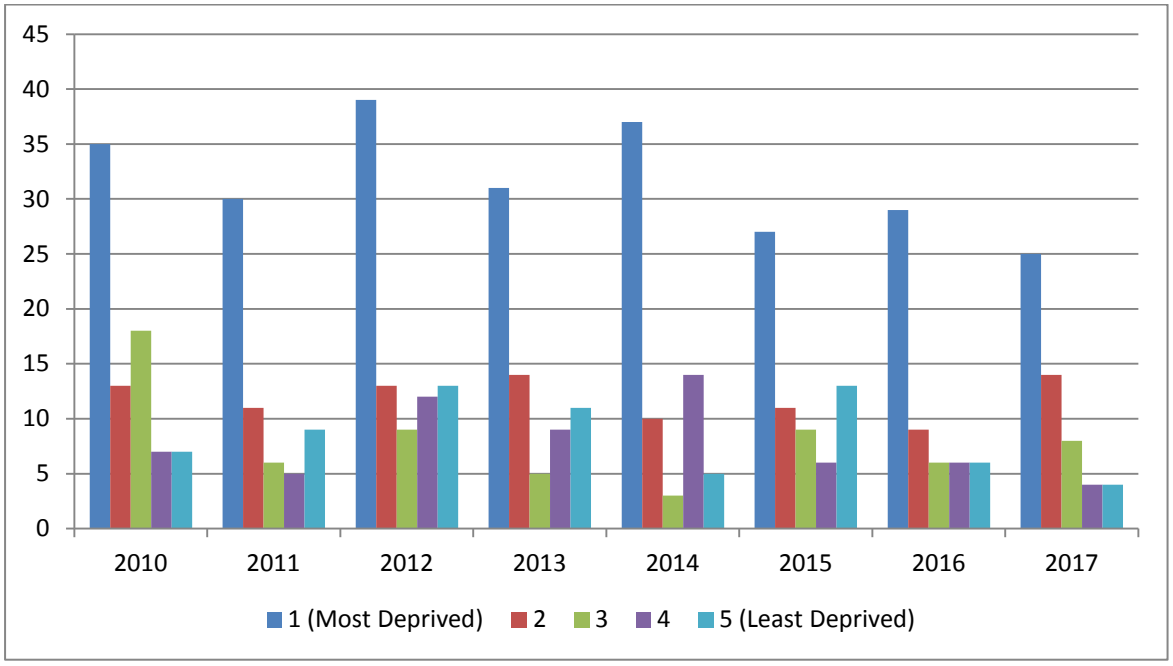
Table 8.13 Number of NHSGGC residents with invasive cervical cancers by age at diagnosis and year of diagnosis

	Year (Diagnosis)								
Age Group	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**
20-29	10	7	12	6	9	8	16	6	74
30-39	23	16	27	23	21	18	7	20	155
40-49	22	10	17	17	14	16	10	13	119
50-59	7	10	9	10	11	9	10	6	72
60-69	≤5	7	11	≤5	6	10	8	≤5	54
70-79	10	8	7	7	≤5	≤5	≤5	≤5	49
80+	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5	20
Total	80	61	86	70	69	66	56	55	543

Source: NHSGGC Invasive Cancer Audit (November 2018)
Numbers ≤5 redacted as per ISD Statistical Disclosure Control Protocol

Figure 8.5 shows the distribution of cervical cancers by deprivation for the period 2010 to 2017. The highest proportion of cervical cancers occurred in women living in the most deprived (SIMD1) areas.

Figure 8.5 Numbers of NHSGGC residents diagnosed with invasive cervical cancer 2010-2017.



Source: NHSGGC Invasive Cancer Audit (January 2018)

Table 8.14 shows the distribution of clinical stage at diagnosis over an eight year period from 2010 to 2017.

Table 8.14 Number of women with invasive cervical cancers by clinical stage by year of diagnosis

	Year (Diagnosis)								
Clinical Staging	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**
Not Known	6	≤5	≤5	0	0	0	0	0	10
1a1 (less than 3mm deep and >=7mm wide)	21	12	20	19	14	11	19	13	129
1a2 (3-5mm deep and <7mm wide)	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5	9
1b (confined to cervix)	14	14	24	19	26	21	10	15	143
2 or Greater (spread outwith cervix)	39	33	38	30	29	33	24	26	252
Total	80	61	86	70	69	66	56	55	543

Source: NHSGGC Invasive Cancer Audit (November 2018)
Numbers ≤5 redacted as per ISD Statistical Disclosure Control Protocol

Table 8.15 shows that, in 2017, 20 of the 55 (36%) cases were screen detected. The rest of the cases presented to the service with symptoms or were incidental findings.

Table 8.15 Number of women with invasive cancers split by modality of presentation by year of diagnosis

	Year (Diagnosis)								
Presentation	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	Total
Not Known	24	20	0	0	≤5	0	≤5	0	48
Incidental Finding	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5	8
Smear detected	29	20	39	31	33	28	27	20	227
Symptomatic	27	21	46	38	34	36	24	34	260
Total	80	61	86	70	69	66	56	55	543

Source: NHSGGC Invasive Cancer Audit (November 2018)
Numbers ≤5 redacted as per ISD Statistical Disclosure Control Protocol

In 2017, 17 of 55 (31%) women had a complete smear history compared to 33 (60%) women who had incomplete smear histories **(Table 8.16)**. Over the eight years audited, 63 (12%) women out of the 543 that developed cancer had never had a smear; 196 (36%) had complete smear histories and 277 (51%) of women had incomplete smear histories.

Table 8.16 Smear histories of women with invasive cervical cancer

	Year (Diagnosis)								
Smear History	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**
Adequate	25	25	34	24	28	21	22	17	196
Incomplete	42	22	40	36	36	39	29	33	277
Not Applicable	12	14	11	10	≤5	≤5	≤5	≤5	63
Not Known	≤5	0	≤5	0	0	≤5	≤5	≤5	7
Total	80	61	86	70	69	66	56	55	543

Source: NHSGGC Invasive Cancer Audit (November 2018)
Numbers ≤5 redacted as per ISD Statistical Disclosure Control Protocol

Table 8.17 shows the follow up status of the women included in the audit of invasive cancer at the time when the audit was carried out.

Table 8.17 Follow up status of women with invasive cervical cancer

	Year (Diagnosis)								
Smear History	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**
Lost to colposcopy service	≤5	0	≤5	≤5	≤5	≤5	0	0	**6**
On follow up at colposcopy	21	8	24	18	13	11	15	10	**120**
On follow up at oncology/Beatson	47	38	46	46	52	48	29	16	**322**
Early Recall	0	0	≤5	0	0	0	≤5	0	**≤5**
Death	7	9	11	≤5	0	≤5	0	≤5	**39**
No further recall	0	≤5	0	0	0	≤5	8	24	**35**
Not Known	≤5	≤5	≤5	≤5	≤5	0	≤5	≤5	**8**
Total	**80**	**61**	**86**	**70**	**69**	**66**	**56**	**55**	**534**

Source: NHSGGC Invasive Cancer Audit (November 2018)
Numbers ≤5 redacted as per ISD Statistical Disclosure Control Protocol

8.12. Quality Improvement

An internal review of cervical screening was undertaken by Price Waterhouse Cooper as part of the 2017-18 internal audit plan approved by the Audit and Risk Committee. Recommendations of this report included:

> 'A clear process should be created which links the analysis of demographic data back to the campaigns and projects/other actions being undertaken. Demographic data should be discussed at every steering group meeting to ensure campaigns and projects are targeted at areas with the lowest uptake rates or identify where a different course of action may be required.'

The recently launched NHS GGC Public Health Strategy (2018)[22] outlines a commitment to reduce inequalities in uptake of screening programmes through targeted intervention plans. The strategy also recognises and aims to support the work of partner organisations in widening access to screening as an approach to early intervention.

In response to these drivers, a more structured approach has been developed with our key stakeholders and NHSGGC's Inequalities Action plan 2019-21

[22] http://www.stor.scot.nhs.uk/ggc/bitstream/11289/579831/1/Public+Health+Strategy+2018+-+2028+A4+-+Landscape+-+10-08-18-01.pdf [Accessed 28th December 2018]

(Appendix A) outlines priorities and actions to widen access and address inequalities in relation to all five adult screening programmes.

The Cervical Screening Governance Group has subsequently established an explicit mechanism to use data to target targeting of promotional activities to those with low uptake including vulnerable or excluded groups.

8.13. Health Improvement

A range of health improvement activities have taken place at local level throughout the Board area in order to improve participation in cervical screening and reduce cancer risk factors.

At GP practice and Primary Care Development level, this has included:

- Increasing appointment availability
- The development of a cervical toolkit for practitioners.

A number of programmes and activities are ongoing in the community. **Figure 8.6** presents these mapped against marginalised populations.

Figure 8.6 Current programmes to promote cervical screening by priority population group

PRIORITY POPULATION GROUP	CURRENT PROGRAMMES
Adults who live in deprived areas	- Awareness raising and community based support in most HSCPs - CRUK facilitators provide support GP practices across all HSCPs.
Adults with learning disabilities	- North East Health Improvement team via Scottish Government Cancer Screening and Inequalities funding has commissioned People First, a specialist Learning Disability organisation to work with Adults with Learning Disabilities.
Adults with severe and enduring mental illness	- Work to access data related to screening uptake and to include screening in the new physical health check
Adults in minority ethnic population groups	- Delivery of awareness sessions to community groups from Jo's Cervical Cancer Trust and HSCPs - Sharing information on barriers and good practice engagement through Jo's Cervical Cancer Trust GP consultations.

Third sector partners CRUK and Jo's Cervical Cancer Trust have worked closely to deliver information and educational sessions. Jo's Cervical Cancer Trust have engaged with GPs to promote cervical cancer campaigns, deliver training and awareness raising to health professionals and reception staff,

pilot and evaluate drop in clinics for marginalised women, and support ‘smear days’ at GP practices by providing information stands. Together with CRUK and NE HSCP, the charity has supported Clyde Gateway to deliver a Scottish Government funded Inequalities project, delivering training on cancer screening to community stakeholders. Both charities have also supported Public Health in training for Learning Disability staff in order raise awareness of informed consent in screening. CRUK have supported Practices to improve screening uptake and delivered training to student nurses, pharmacists and GPs.

8.14. Challenges and Future Priorities

- To counter the decreasing uptake of cervical screening by implementing a planned programme of promotional activities.

- To continue monitoring of impact of changes to GMS contract on uptake of cervical screening. To continue to work in partnership with CRUK and Jo’s Cervical Cancer Trust to support GP practices to sustain good practice to support eligible women to participate in cervical screening programme.

- The implementation of the NHSGGC Adult Screening Inequalities Action Plan (Appendix A) will enable a more coordinated approach to reducing inequalities in uptake through targeted intervention plans. This will include working with specialist learning disability and mental health staff to develop approaches to support the participation of their patient groups in cervical screening.

- To support national public health information campaigns to increase cervical screening uptake among women in younger age groups.

Appendix 8.1

i. **Management and follow-up advice for cytology results**

ii. **Management and follow up for cytology results: Post Total Hysterectomy**

iii. **Management and follow up for cytology post treatment cervical smear and HPV test (Test of Cure)**

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i. Management and follow-up advice for cytology results

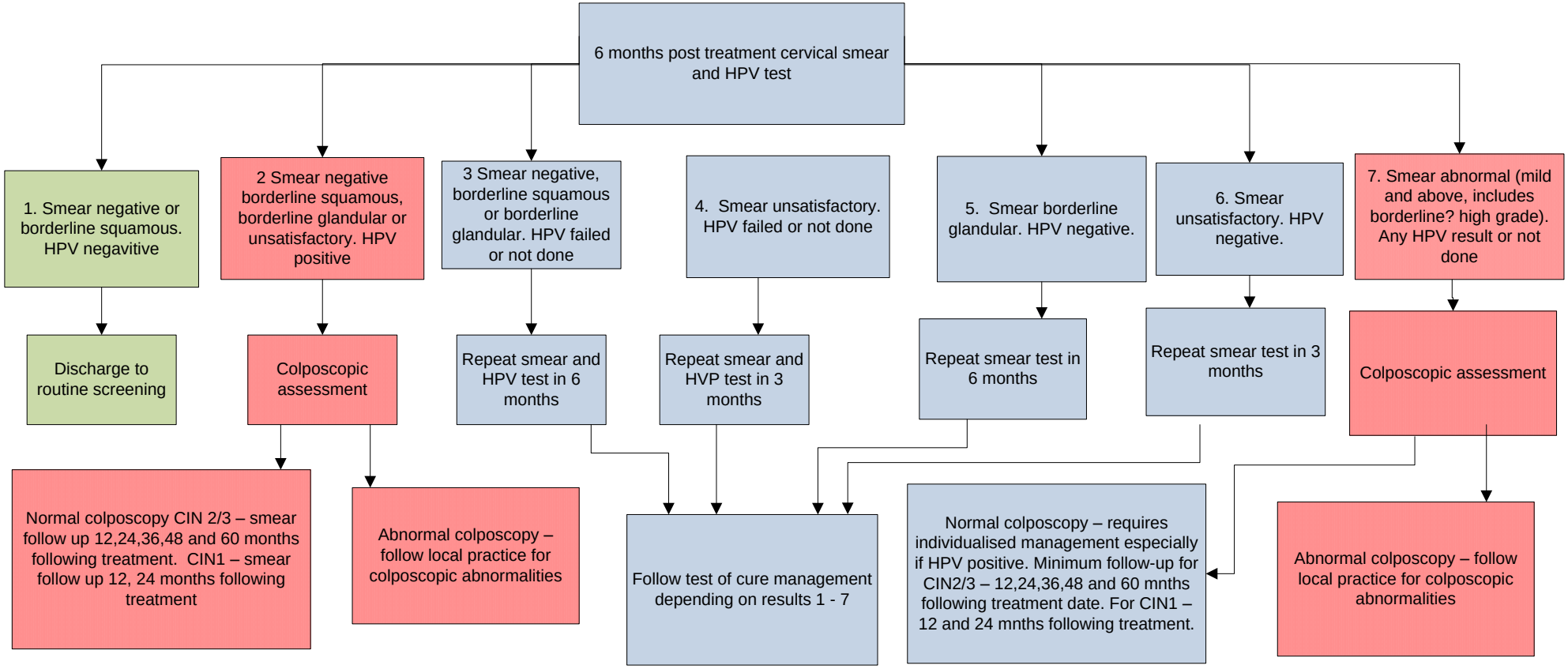
SMEAR REPORT	MANAGEMENT
Negative	36 month recall
Negative, after borderline	Further repeat at 6 months Return to routine recall after 2nd negative
Negative, after mild	Further repeat at 6 & 18 months. Return to routine recall after 3rd negative
Unsatisfactory	3 month recall. Refer after third in succession
Low grade abnormalities	
Borderline Squamous Changes +/- HPV	6 month recall. Refer after third. ? High grade – Flag as such and Refer to Colposcopy on 1st
Borderline Glandular Changes	6 month recall. Refer after second
Low grade dyskaryosis	Repeat in 6 months Refer after second
High grade abnormalities	
Glandular abnormality	Urgent (within 2 weeks) refer to Colposcopy
Moderate Dyskaryosis	Refer to Colposcopy
Severe Dyskaryosis	Refer to Colposcopy
Severe Dyskaryosis / invasive	Urgent (within 2 weeks) refer to Colposcopy
Adenocarcinoma – Endocervical	Urgent (within 2 weeks) refer to Colposcopy
Endometrial Adenocarcinoma	Refer to Gynaecology (Early recall will not be triggered for such cases as the detected abnormality is not relevant to cervical screening)

i. Management and follow up for cytology results: Post Total Hysterectomy

On routine recall No CIN/CGIN in hysterectomy	No further recall
On non-routine recall No CIN/CGIN in hysterectomy	No further recall
CIN in hysterectomy (any grade, completely or incompletely excised)	Vault smear and HPV Test at 6 months (Test of Cure). If both negative, no further recall. If abnormal refer back and manage outcome accordingly.
Hysterectomy as treatment for CGIN (any grade)	Vault smears at 6 and 18 months. If negative, no further recall. If abnormal refer back and manage outcome accordingly.

CIN = cervical intraepithelial neoplasia
CGIN = cervical glandular intraepithelial neoplasia

ii. Management and follow up for cytology post treatment cervical smear and HPV test (Test of Cure)



Appendix 8.2 National Performance Standards 2017-2018

Source: ISD Scotland http://isdscotland.org/Health-Topics/Cancer/Cervical-Screening/

Uptake for Cervical Screening; Scotland & NHSGGC 1st April 2017 to 31st March 2018

Percentage uptake of females aged 25-64. Uptake based on being screened within the specified period (within last 3.5 or 5.5 years).

Screening uptake	Standard %	Scotland %	Greater Glasgow & Clyde %
The percentage of eligible women (aged 25 to 64) who were recorded as screened adequately	80	**72.8**	69.3
Percentage uptake by deprivation quintile			
SIMD 1 (most deprived)	80	**66.8**	66.5
SIMD 2		**70.7**	68.9
SIMD 3		**73.2**	68.8
SIMD 4		**76.1**	70.4
SIMD 5 (least deprived)		**77.8**	74.9

Uptake for Cervical Screening by HPV vaccinated: Scotland & NHSGGC 1st April 2017 to 31st March 2018

Percentage uptake of females who had a record of a previous screening test taken within last 3.5 years by age

HPV vaccination status	AGE					
	21	22	23	24	25	26
Immunised (full)[1]						
NHSGGC	44.0	55.6	65.6	71.5	69.8	75.7
Scotland	48.7	56.0	67.2	68.8	71.0	75.0
Immunised (incomplete)[2]						
NHSGGC	33.3	46.9	66.1	64.0	65.8	73.3
Scotland	41.5	41.9	60.0	64.2	66.3	72.7
Non-Immunised						
NHSGGC	19.9	31.7	41.7	46.4	42.7	52.7
Scotland	23.6	26.4	34.6	37.2	34.4	43.3

[1]The Immunisation Status of FULL is where the individual has been Fully Immunised i.e. had all HPV doses.
[2]Incomplete is where the individual has had at least one of the Immunisations but not all of them.

Cervical screening tests processed[1]: Scotland & NHSGGC laboratories, 1st April 2017 to 31st March 2018

Year/ quarter	Scotland	Greater Glasgow & Clyde
Q4	103,483	26,229
Q3	86,294	22,237
Q2	91,590	23,316
Q1	97,015	24,434
TOTAL	**378,382**	**96,216**

[1.] Data includes unsatisfactory screening tests.

Laboratory Turnaround times[1] for 95% of all cervical screening tests processed at NHS laboratories: Scotland & NHSGGC laboratories, 1st April 2017 to 31st March 2018

Year/ quarter	Scotland	Greater Glasgow & Clyde
Q4	28	28
Q3	21	26
Q2	19	17
Q1	23	20

[1.] The turnaround time is defined as the number of days from the date the sample was received by the laboratory to the date the report was issued by the laboratory.

Average reporting times[1] for cervical screening tests: Scotland & NHSGGC laboratories, 1st April 2017 to 31st March 2018 (Mean number of days by quarter)

Year/ quarter	Scotland	Greater Glasgow & Clyde
Q4	**27**	28
Q3	**20**	22
Q2	**21**	21
Q1	**24**	23

Appendix 8.3

Members of Cervical Screening Steering Group (As at March 2018)

Dr Emilia Crighton	Deputy Director of Public Health (Chair)
Ms Christine Black	Consultant in Sexual and Reproductive Health
Dr Kevin Burton	Consultant Gynaecologist
Mr Paul Burton	Information Manager
Mrs Lin Calderwood	HI&T Service Delivery Manager
Mrs Pam Campbell	Records Manager
Lucy Clancy	General Practice Support & Development Nurse
Dr Miriam Deeny	Consultant Gynaecologist, GRI
Mrs Elaine Garman	Public Health Specialist, NHS Highland
Dr Robert Henderson	Consultant in Public Health Medicine, Highland
Ms Heather Jarvie	Public Health Programme Manager
Mrs Kathy Kenmuir	Practice Nurse Support and Development Team Manager
Dr Graeme Marshall	Clinical Director, North East Glasgow
Ms Alana Struthers	CRUK Facilitator, West of Scotland
Dr Margaret Laing	Staff Grade in Cytology/Colposcopy
Mrs Michelle McLachlan	General Manager, Obstetrics
Dr Abigail Oakley	Consultant Pathologist
Dr Ken O'Neill	Clinical Director, Glasgow City HSCP
Mr Graham Reid	Specialty Manager, Cytology
Mrs Elizabeth Rennie	Programme Manager, Screening Dept
Mrs Alison Street	General Practice Support and Development Nurse

Chapter 9 - Diabetic Retinopathy Screening (DRS)

Summary

Diabetes mellitus is a long-term condition in which the level of glucose in the blood is raised leading to abnormal fat metabolism and other complications. There are two main types of diabetes: type 1 and type 2.

The Scottish Diabetes Survey 2017 reports that in Scotland, there were 298,504 people with known diabetes recorded on local diabetes registers in 2017, representing 5.5% of the population. In the same year in Greater Glasgow and Clyde, there were 64,090 people with known diabetes (5.5% of the population), compared to 48,602 people in 2007 (4.1% of the population) an increase of 31.9%.

In 2017-2018 there were 67,437 people with known diabetes being treated in NHS Greater Glasgow and Clyde. Of these, 58,747 (87.0%) were eligible for screening. 10,071 (14.9%) people were not eligible for screening because they were either permanently or temporarily suspended from the programme. Of those eligible for DRS screening, 45,626 (77.7%) attended screening.

Uptake is poorest in younger adults (age 25-34 was the lowest at 58.4%, the most socio-economically deprived residents (SIMD 1 was 73.8%), among people with learning disabilities (69.8%), people with severe and enduring mental illness (70.5%) and among ethnic minorities. There are also lower uptake rates in some HSCPs that are not wholly explained by socio-economic deprivation.

A new national Diabetic Retinopathy Screening (DRS) IT system, VECTOR, was introduced in March 2017. This has been used to produce the National KPI data used in this report. In addition, the VECTOR reporting environment was used to allow for local analysis to provide insight to programme performance and delivery.

Chapter Contents

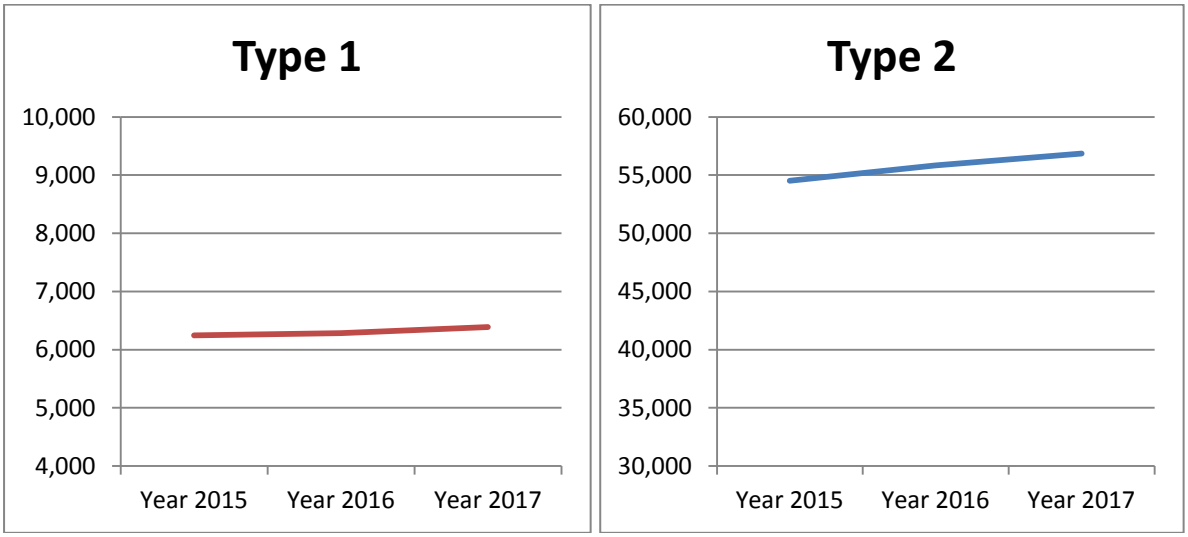
9.1. Background

Diabetes mellitus is a long-term condition in which the level of glucose in the blood is raised leading to abnormal fat metabolism and other complications. There are two main types of diabetes: type 1 and type 2. Type 1 often develops before the age of 40 and usually during the teenage years. Type 2 is far more common than type 1, and typically affects people over the age of 40 (although increasingly younger people are affected as well). It is often associated with being overweight or obese and people of South Asian, African-Caribbean or Middle Eastern origins are more frequently affected.

The Scottish Diabetes Survey 2017[23] reports that in Scotland, there were 298,504 people with known diabetes recorded on local diabetes registers in 2017, representing 5.5% of the population. 88.2% (263,271) of all people registered with diabetes were recorded as having type 2 diabetes. 10.5% (31,447) of all registered people were recorded as having type1 diabetes. In Greater Glasgow and Clyde, there were 64,090 people with known diabetes in 2017, (5.5% of the population) compared to 48,602 people in 2007 (4.1% of the population) an increase of 31.9%.

Figures 9.1and 9.1b illustrate the increase in the number of NHSGGC residents with type 1 and type 2 diabetes in the previous three year period. In 2015 there were 6,244 people with type 1 diabetes when compared to 6,390 in 2017, an increase of 2.3 %. For type 2 diabetes, there has been a greater increase over the time period, 54,515 people in 2015 when compared to 56,854 in 2017, showing an increase of 4.3 %.

Figures 9.1a and 9.1b Number of people with type 1 diabetes and with type 2 diabetes in NHSGGC 2015- 2017.



Diabetic Retinopathy is a complication of diabetes affecting blood vessels of the retina and is the biggest single cause of blindness and visual impairment amongst working age people in Scotland. Retinopathy is symptom-free until its late stages,

[23] http://www.diabetesinscotland.org.uk/Publications/SDS%202017.pdf

and programmes of retinal screening can reduce the risk of blindness in the population by detecting retinopathy at a stage at which it may be effectively treated. If it is detected early enough, treatment can prevent the progression of the disease and save sight for many years in most patients.

9.2. Aim of the Screening Programme and Eligible Population

The national Diabetic Retinopathy Screening (DRS) Programme was implemented across NHSGGC in 2004-2005 and is an integral part of patients' diabetes care. The primary aim of the programme is the detection of referable (sight-threatening) retinopathy. A secondary aim is the detection of lesser degrees of diabetic retinopathy. This can have implications for the medical management of people with diabetes.

All people with diabetes aged 12 and over who are resident in the NHSGGC area are eligible for annual Diabetic Retinopathy Screening.

The programme performance and quality of national DRS screening is monitored via defined National DRS Screening Standards[24] and Key Performance Indicators[25].

In 2020 the service will implement the UK NSC recommendation that, for patients with diabetes at low risk of sight loss, the interval between screening tests should change from one year to two years. There will also be implementation of DRS Optical Coherence Tomography (OCT). By changing the screening interval for patients at low risk of sight loss from one year to two years it is predicted that there will be a reduction in DRS screening appointments. However this will be offset by an increase in new DRS OCT surveillance appointments.

9.3. The Screening Test

In the first instance, a digital photograph is taken of the individual's retina. If the photograph cannot be graded then a further slit lamp examination will be performed.

There are two main information systems used in the provision of Diabetic Retinopathy Screening.

i) VECTOR provides the call/recall, image capture, grading, quality assurance and result delivery.
ii) SCI-Diabetes is an essential component for effective Diabetic Retinopathy Screening. It provides the diabetes population register for diabetic

[24] http://www.healthcareimprovementscotland.org/our_work/long_term_conditions/programme_resources/diabetic_retinopathy_screening.aspx (Accessed October 2018)
[25] http://www.ndrs-wp.scot.nhs.uk/?page_id=122 (Accessed October 2018)

retinopathy screening call/recall and the screening results can be viewed here by clinical staff involved in the care of patients with diabetes.

9.4. Screening Setting

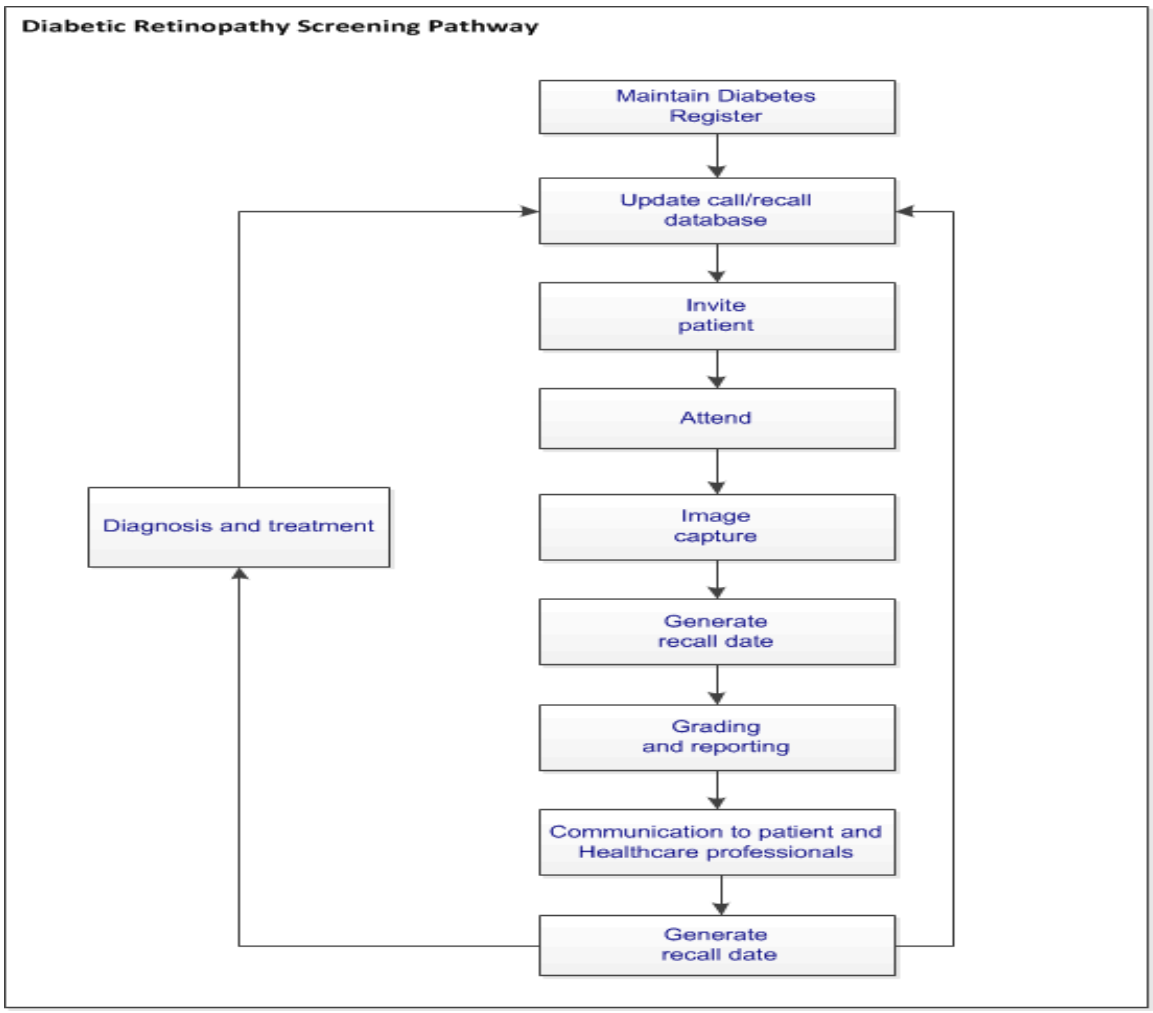
Across Greater Glasgow and Clyde screening takes place at five hospital locations and 14 health centres or clinics.

The screening service also carries out slit lamp examinations from the five hospitals and two of the health centres/clinics for patients who are not suitable for retinal photography.

9.5. Screening Pathway

Figure 9.2 illustrates the pathway to reduce diabetes related blindness in the general population by identifying and treating sight threatening diabetic retinopathy.

Figure 9.2 Diabetic Retinopathy screening pathway



9.6. Delivery of NHSGGC Diabetic Retinopathy Screening Programme

A new national DRS IT system, VECTOR, was introduced in March 2017. This has been used to produce the National KPI data used in this report for the period of 1st April 2017 to 31st March 2018. In addition, the VECTOR reporting environment was used to allow for local analysis to provide insight to programme performance and delivery.

The DRS screening programme KPI's cover information on uptake of screening, screening performance, outcomes of screening and Ophthalmology performance. **Appendix 9.1** summarises the nationally reported KPIs for DRS screening programme for the time period 1st April to 2017 to 31st March 2018.

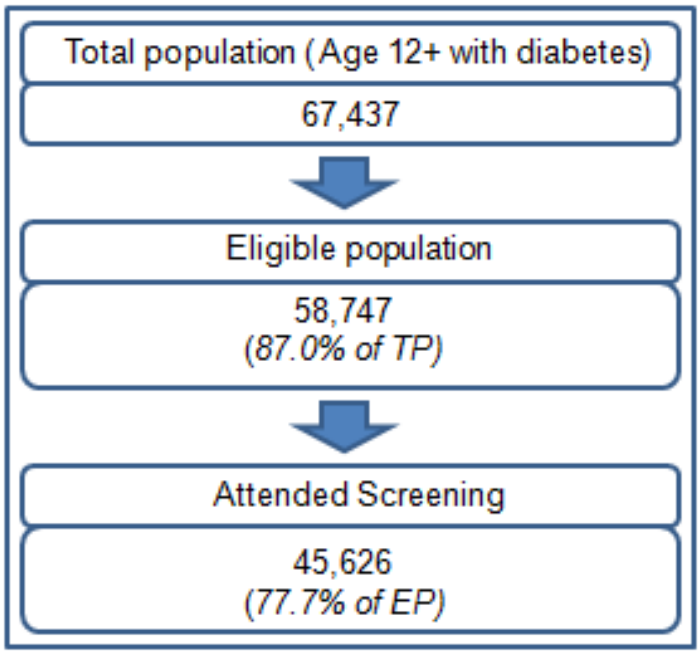
The national annual screening uptake target is 80%. NHSGGC did not meet this target (77.7%) in 2017/2018. KPIs are reported by Board of Treatment.

During 2017/2018 there were 67,437 people with known diabetes in NHS Greater Glasgow and Clyde. Of these, 58,747 (87.0%) were eligible for DRS screening **(Table 9.1).**

A total of 10,171 (15.1%) people were not eligible for screening because they were either permanently or temporarily suspended from the programme. The main reason for suspension from screening was ongoing ophthalmology care following attendance in diabetic retinopathy screening; deemed clinically unfit by the general practitioner or no longer diabetic.

Of the 58,747 people with diabetes eligible for screening, 45,626 (77.7%) attended screening during 2017/2018, and 45,007 (76.6%) were successfully screened.

Table 9.1 NHSGGC DRS Screening Programme 2017-2018 by Board of Treatment



Analysis of the data by Board of residence provides a localised picture of the demographic breakdown of the eligible resident population who were screened during 2017/2018. Please note that the figures below may differ from those quoted in national statistics.

Table 9.2 shows that more than half (55.4%) of the eligible resident population were male. Males were also slightly more likely to attend screening than females (78.8% vs. 76.1%).

Table 9.2 Uptake of DRS screening by sex in NHSGGC, by Board of Residence 2017-2018

Sex	Eligible Population	% of eligible population	Attended Screening (full year)	% Attended Screening (full year)
Female	26,049	44.6	19,815	76.1
Male	32,317	55.4	25,473	78.8
Unknown	≤5	≤5	≤5	n/a
TOTAL	**58,367**	**100**	**45,288**	**77.6**

Source: VECTOR 2017/18 (accessed October 2018)
Numbers ≤5 redacted as per ISD Statistical Disclosure Control Protocol

Table 9.3 shows that approximately half of the eligible resident population (50.7%) are aged between 55 to 74 years of age. Eligible individuals aged 65 to 74 years were most likely to attend DRS screening (84.9%) compared to other age groups.

Table 9.3 Uptake of DRS screening by age in NHSGGC, by Board of Residence 2017-2018

Age	Eligible Population	% of eligible population	Attended Screening (full year)	% Attended Screening (full year)
12 to 14	137	0.2	103	75.2
15 to 24	978	1.7	629	64.3
25 to 34	1,749	3.0	1,022	58.4
35 to 44	3,593	6.2	2,317	64.5
45 to 54	8,776	15.0	6,331	72.1
55 to 64	14,805	25.4	11,730	79.2
65 to 74	14,764	25.3	12,531	84.9
75 to 84	10,361	17.8	8,359	80.7
85+	3,204	5.5	2,266	70.7
TOTAL	58,367	100	45,288	77.6

Source: VECTOR 2017/18 (accessed October 2018)

Approximately 40% of the eligible population resided in the most deprived Board areas. There was a consistent pattern that DRS screening uptake increased with decreasing levels of deprivation **(Table 9.4).** Uptake was lowest among people

residing in the most deprived areas (73.8%) and highest among those residing in the least deprived areas (84.1%).

Table 9.4 Uptake of DRS screening by deprivation in NHSGGC, by Board of Residence 2017-2018

SIMD	Eligible Population	% of eligible population	Attended Screening (full year)	% Attended Screening (full year)
1 (most deprived)	23,650	40.5	17,459	73.8
2	10,435	17.9	8,088	77.5
3	6,971	11.9	5,504	79.0
4	6,416	11.0	5,312	82.8
5 (least deprived)	8,163	14.0	6,861	84.1
Unknown	2,732	4.7	2,064	75.5
TOTAL	**58,367**	**100.0**	**45,288**	**77.6**

Source: VECTOR 2017/18 (accessed October 2018)

In addition to the information provided above which was provided by national analysts, data was extracted locally and on a different date to enable further analysis. Consequently the numbers may vary slightly from previous tables.

Table 9.5 shows that the majority of the eligible population are White British (77.6%). DRS screening uptake was amongst the highest among this group (78.1%) with Bangladeshi (79.7%) uptake also high, although it is worth noting that the numbers of eligible people in this ethnic group are relatively low.

Table 9.5 Uptake of DRS screening by ethnicity in NHSGGC, by Board of Residence 2017-2018

2001 Census Ethnic Group	Not Screened	Screened	Total eligible	% Screened
White – British	9,863	35,104	44,967	*78.1*
White – Irish	1,239	4,360	5,599	*77.9*
White - any other white background	360	919	1,279	*71.9*
Asian or Asian British – Indian	236	783	1,019	*76.8*
Asian or Asian British – Pakistani	628	2,076	2,704	*76.8*
Asian or Asian British - Bangladeshi	29	114	143	*79.7*
Asian or Asian British - any other Asian background	18	42	60	*70.0*
Black or Black British – African/ Caribbean*	71	179	250	*71.6*
Other ethnic groups – Chinese	86	291	377	*77.2*
Other ethnic groups - any other ethnic group	254	858	1,112	*77.2*
Unclassified	179	267	446	*59.9*
Total	**12,963**	**44,993**	**57,956**	***77.6***

Source: VECTOR; OnoMap, December 2018 * 3 were CARRIBBEAN

There are variations in screening uptake across HSCPs **(Table 9.6).** They range from 73.5% in Glasgow City HSCP North East Sector to 83.2% in East Dunbartonshire HSCP. Only two HSCPs meet the minimum target of 80%. However, when the known effects of age, sex, deprivation and ethnicity are taken into account by standardisation, the differences in uptake across HSPCs are even larger (SUR% ranging from 70.6% to 86.9%). This tells us that the differences in uptake across HSCP's may be explained by their differences in local practice rather than population demographics. No HSCP led activities to promote DRS have been identified and differences in uptake will be investigated during 2019.

Table 9.6 indirectly standardised uptake of diabetic retinopathy screening by HSCP in NHGGC, 2017-18

HSCP	Not Screened	Screened	Total	*% Screened*	SUR %	SUR % LCI	SUR % UCI
East Dunbartonshire	821	4,059	4,880	*83.2*	***86.9***	*84.2*	*89.6*
East Renfrewshire	840	3,247	4,087	*79.4*	***82.7***	*79.9*	*85.6*
Glasgow North East Sector	2,497	6,921	9,418	*73.5*	***70.6***	*68.9*	*72.2*
Glasgow North West Sector	2,024	6,827	8,851	*77.1*	***75.1***	*73.3*	*76.9*
Glasgow South Sector	2,887	9,469	12,356	*76.6*	***74.5***	*73.0*	*76.0*
Glasgow City	*7,408*	*23,217*	*30,625*	*75.8*	***73.4***	*72.5*	*74.4*
Inverclyde	829	3,538	4,367	*81.0*	***80.3***	*77.7*	*83.0*
Renfrewshire	1,892	7,146	9,038	*79.1*	***79.2***	*77.3*	*81.0*
West Dunbartonshire	1,173	3,786	4,959	*76.3*	***75.2***	*72.8*	*77.5*
Total	**12,963**	**44,993**	**57,956**	***77.6***			

Source: VECTOR; OnoMap, December 2018
SUR = Standardised Uptake Rate; UCI = Upper Confidence Intervals; LCI = Lower Confidence Intervals

To enable further local analysis of uptake rates, geographical mapping at data-zone level has been carried out. The locations of DRS clinics are also shown on the maps. The mapping illustrates that uptake rates in some pockets of NHSGGC can be low. Against a population target of 80%, 241 of the 1456 data-zones did not achieve 70% uptake, 42 of which were below 60%. Data-zone maps for NHSGGC and by HSCP are available on the PHSU website[26]

[26] Diabetic Retinopathy Screening Uptake Data Zone maps: https://www.nhsggc.org.uk/your-health/public-health/public-health-screening-unit/reports/

People who were registered with a learning disability had poorer uptake of DRS **(Table 9.7)** at 69.8% compared to 77.7% in the rest of the population.

Table 9.7 Uptake of DRS screening among eligible population by learning disability for NHS Greater Glasgow and Clyde 2017-18, by Board of Residence.

Learning Disability	Not Screened	Attended Screening	Total Eligible	*% Uptake*
Rest of population	12,793	44,600	57,393	*77.7*
Registered with a LD	170	393	563	*69.8*
Total	12,963	44,993	57,956	*77.6*

Source: Source: VECTOR, LD Register, December 2018

People registered on PsyCIS have had at least one episode of psychosis which is typically seen in patients with a severe or enduring mental illness. These individuals had poorer uptake of DRS **(Table 9.8)**. It was 70.5% compared to 77.8% in the rest of the population.

Table 9.8 Uptake of DRS screening among eligible resident population among people with severe and enduring mental illness for NHS Greater Glasgow and Clyde 2017-18

Severe and Enduring Mental Illness	Not Screened	Attended Screening	Total Eligible	*% Uptake*
Rest of population	12,653	44,253	56,906	*77.8*
Registered on PsyCIS	310	740	1,050	*70.5*
Total	12,963	44,993	57,956	*77.6*

Source: VECTOR, PsyCIS, December 2018

9.7. Challenges and Future Developments

It is anticipated that the number of people with diabetes will continue to increase, requiring additional screening capacity and resources in the coming year. The Scottish Government have agreed to introduce changes to screening intervals and there will be a planned approach to implementation of this change, which is likely to come into effect in 2020.

The development of a NHSGGC Inequalities Plan for Adult Screening programmes (Appendix A) will enable a more coordinated approach to reducing inequalities in uptake through targeted intervention plans. DRS actions will include mapping clinic availability and location against screening uptake figures, and implementing health and wellbeing support for patients within the clinics.

Partnership work with the third sector and HSCPs will continue in order to support eligible patients to participate in the DRS programme.

Appendix 9.1

Diabetic Retinopathy Screening Service reports for Quarter 4 2017/2018

Report start date 01/04/2017 report end date 01/04/2018
Report Interval = 365 days. All data taken from Vector.
Source: DRS National statistics 2018

KPI	HIS Target June 2016 (where applicable)	Description	Board of treatment	
			Greater Glasgow & Clyde	Scotland
KPI 0: Summary Statistics		Total Population (TP)	67,437	**319,308**
		Temporarily suspended (TS)	6,198	**22,617**
		Permanently suspended (PS)	3,873	**25,646**
		Temporarily unavailable (TU)	1,381	**3,562**
		Eligible Population (EP = TP-TS-PS+TU)	58,747	**274,607**
Screening Uptake				
Call/Recall (HIS Standards 2)	Within 30 calendar days for newly diagnosed appointment offer. (HIS Standard 2.3)	2.3 The invitation to attend diabetic retinopathy screening is offered to all newly diagnosed patients within 30 calendar days of the DRS Collaborative4 receiving notification.	N/A	N/A
	Within 90 calendar days for newly diagnosed appointment date. (HIS Standard 2.4)	2.4 The date of the appointment offered to all newly diagnosed patients is within 90 calendar days of the DRS Collaborative4 receiving notification.	N/A	N/A
KPI 1: Screening invitation rate (HIS Standard 3)	100% for Q4 of eligible people, regardless of personal circumstances or characteristics are offered an	People attending screening without invitation (API)	692	**9,884**
		People invited at least once (INV)	56,391	**250,727**
		% (100 * INV / (EP - API))	97.1%	**94.7%**

	opportunity to attend. (HIS Standard 3.3)			
KPI 2: Screening uptake rate (HIS Standard 3)	NHS boards achieve an attendance of 80% for Q4. (HIS Standard 3.1)	People attending at least once (ATT)	45,626	**201,220**
		% (100 * ATT / EP)	77.7%	**73.3%**
DNA rate	Indicative DNA rate by %	**% (100 * INV - ATT)**	19.5%	**21.4%**
KPI 3: Annual successful screening rate (HIS Standard 3)	NHS boards achieve an uptake of 80% pa. (HIS Standard 3.2)	People successfully screened in the previous year (ANN)	45,007	**196,918**
		% (100 * SUC1 /EP)	76.6%	**71.7%**
KPI 4: Successful screening rate (HIS Standard 3)	NHS boards achieve an uptake of 80% for Q4 (HIS Standard 3.2)	People successfully screened in reporting period (SUC)	45,007	**196,963**
		% (100 * SUC2 /EP)	76.6%	**71.7%**
KPI 5: Biennial successful screening rate (HIS Standard 3)	NHS boards achieve an uptake of 80% pa. (HIS Standard 3.2)	People successfully screened (biennial) (BIE)	47,210	**211,358**
		% (100 * BIE / EP)	80.4%	**77.0%**
KPI 6: Annual patient technical recall rate	As low as possible	People unsuccessfully screened (UNSUC)	1,042	**5,752**
		% (100 * UNSUC / EP)	1.8%	**2.1%**
KPI 7A: Annual photographic technical failure rate (HIS Standard 4)	NHS boards achieve a maximum rate of ungradeable images of 2.5% for digital imaging. (HIS Standard 4.3)	Photographic screenings (PS)	45,952	**204,752**
		Unsuccessful photographic screening episodes (UPS)	1,206	**6,565**
		% (100 * UPS/ PS)	2.6%	**3.2%**
KPI 7B: Annual slit lamp technical failure rate	NHS boards achieve a maximum rate of ungradeable images of	Slit lamp screenings (SL)	3,116	**15,886**
		Unsuccessful slit lamp screening episodes (USL)	22	**383**

	2.0% for slit lamp examinations. (HIS Standard 4.3)	**% (100 * USL / SL)**	0.7%	**2.4%**
KPI 7: Annual overall technical failure rate	As low as possible	Slit lamp screenings + photographic screenings (SLPS)	49,068	**220,638**
		Unsuccessful slit lamp screenings & photographic screenings (USLUPS)	1,228	**6,948**
		% (100 * USLUPS / SLPS)	2.5%	**3.1%**
KPI 8: Duration to written report	A minimum of 95% of people screened are sent the result within 20 working days of being screened.	Longest recorded number of days to written report (LRD)	302	**302**
		Average of the number of days to written report (AD)	32	**12**
		Median of the number of days to written report (MD)	35	**8**
KPI 9: Written report success rate		Episodes with <= 20 working days to written report (E20D)	20,09	**151,656**
		% (100 * E20D / NE)	42.67%	**69.4%**
Screening outcomes				
KPI 10: Twelve Month Recall result rate		Successful screening episodes (excl. ophthalmology examinations) (SSE)	*47,743*	***211,793***
		% (100* SSE/EP)	*81.3%*	***77.1%***
		Screening episodes (excl. ophthalmology examinations) with negative result (SEN)	*497*	***2,508***
		% (100 * SEN / SSE)	*1.0%*	***1.2%***
KPI 11: Six Month Recall result rate		Screening episodes (excl. ophthalmology examinations) with observable result	*662*	***3,109***

		(SEO)		
		% (100 * SEO / SSE)	*1.4%*	***1.5%***
KPI 12: Six Month recall rescreen rate		People with last result 'observable' in the first 6 month of the interval (POR)	*276*	***1,212***
		People within POR who commenced an examination within 6 month (PC6M)	*37*	***220***
		% (100 * PC6M / POR)	*13.4%*	***18.2%***
KPI 13: Referable Result rate		Screening episodes (excl. ophthalmology examinations) with referable result (SER)	*2,159*	***8,422***
		% (100 * SER / SSE)	*4.5%*	***4.0%***
Ophthalmology performance				
KPI 14: Ophthalmology Report Interval		Patients with an outcome of 'Refer to Ophthalmology ' in the first 6 month of the interval (RO)	959	**3,840**
		% (100 * RO/EP)	1.6%	**1.4%**
		Patients within RO with a subsequent Ophthalmology examination (SOE)	643	**1,789**
		% (100 * SOE/RO)	67.0%	**46.6%**
		Longest recorded days to ophthalmology examination for the first qualifying episode (LRDOE)	269	**320**
		Longest recorded to Ophthalmology examination for the first qualifying episode (based on 30 days/month –	38 weeks 3 days	**45 weeks 5 days**

		months & days)		
		Average of the number of days to Ophthalmology examination (ADOE)	76	**79**
KPI 15: Ophthalmology review target		Patients with an outcome of 'Refer to Ophthalmology ' in the first 6 months of the interval (RO)	959	**3,828**
		Number of these patients for whom the days to Ophthalmology examination is less than or equal to referral target (90 days) (REFT)	19	**114**
		% (100 * REFT / RO)	2.0%	**3.0%**
KPI 16: Ophthalmology attendance rate		People who attended at least 1 Ophthalmology examination with a screening outcome of 'Re-screen in 12 months', 'Re-screen in 6 months' or 'Retain under Ophthalmology review' (OPHTH)	4,857	**10,651**
		Screening population (SP)	63,312	**292,035**
		% (100 * OPHTH / SP)	7.7%	**3.6%**
KPI 17: Ophthalmology suspensions rate		People temporarily suspended from screening for reason of "under the care of Ophthalmologist" (UCO)	4,565	**17,428**
		Screening population (SP)	63,312	**292,035**
		% (100 * UCO / SP)	7.2%	**6.0%**

Appendix 9.2

Members of Diabetic Retinopathy Screening Steering Group (As at 31st March 2018)

Dr Emilia Crighton	Deputy Director of Public Health (chair)
Mr Jim Bretherton	Clinical Service Manager
Mr Paul Burton	Information Manager
Mrs Lin Calderwood	HI&T Screening Service Delivery Manager
Dr Mike Gavin	Consultant Ophthalmologist
Mrs Jo Gibson	Head of Health & Community Care, West Dunbartonshire HSCP
Mrs Elaine Hagen	Programme Support Officer, Screening Department
Mrs Fiona Heggie	Clinical Nurse Co-ordinator, Retinal Screening
Ms Heather Jarvie	Public Health Programme Manager
Mr Stuart Laird	Area Optometric Committee
Ms Gillian Kinstrie	Co-ordinator for MCN for Diabetes
Dr Alice McTrusty	Optometrist/Lecturer GCU/AOC,
Mr Eddie McVey	Optometric Advisor
Mrs Elizabeth Rennie	Programme Manager, Screening Dept
Mr David Sawers	DRS Service Manager
Mrs Sandra Simpson	Assistant Programme Manager, Screening Department
Dr William Wykes	Consultant Ophthalmologist
Dr Sonia Zachariah	Specialty Doctor, Diabetic Retinal Screening

Appendix A

Adult Screening Inequalities Action Plan 2019-21: Key actions

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
1. Provide support to GP practices to access, analyse and use their data for planning and quality improvement purposes.	ALL SCREENING	Primary Care	- Primary Care Development - Public Health Directorate and HSCPs - NHS analysts and eHealth	All	Practices are able to identify issues for local improvement.	2019-21
2. Provide support to GP practices to maintain patient record including mobile number, appropriate read coding, identification and articulation of support needs.	ALL SCREENING	Primary Care	- Primary Care Development - Third Sector Organisations	All	All eligible patients in practice are invited.	2019-21

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
3. Identify and address coding actions which may impact on eligibility status and patient communication.	ALL SCREENING	Primary Care	- Primary Care Development - Public Health Directorate and HSCPs	- Patients who have been diagnosed with cancer - Transgender patients	Inequalities in eligibility status are addressed.	2019-21
4. Specify calls to action related to priority groups in screening when data sharing with GP practices and clusters.	ALL SCREENING	Primary Care	- Public Health Directorate and HSCPs	All	Local issues have an associated improvement activity.	2019-20
5. Utilise mapping of resources to develop patient and carer information pathways.	ALL SCREENING	- Primary Care - Community - Prisons	- Public Health Directorate and HSCPs - Accessible Information Lead - Prison Health Care - All partners	All	Improved informed participation.	2019-20

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
6. Increase use (distribution and support for understanding) of accessible patient information and digital displays as tools to aid informed participation.	ALL SCREENING	- Primary Care - Community - Prisons - Learning Disability Teams	- HSCPs - Public Health Directorate - Primary Care Development - Jo's Cervical Cancer Trust - Bowel Cancer UK - Cancer Research UK	- Adults with learning disabilities - Speakers of languages other than English (Adults in minority ethnic groups)	Patients are better able to make an informed decision.	2019-20
7. Develop a Learn Pro module to improve access to CPD on adult screening programmes for staff who are in a position to support informed participation.	ALL SCREENING	All NHS settings	- Public Health Directorate - Primary Care Development	All	Staff are updated on service changes and have an improved understanding of role in widening access.	2020-21

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
8. Update protocols for providing access to screening adults from travelling communities and armed forces personnel.	ALL SCREENING	- Primary Care - Community	- Public Health Directorate	- Adults from travelling communities - Armed forces personnel	Access pathways are identified and can be implemented/ improved.	2019-20
9. Monitor screening uptake and engagement with the screening programmes in prisons withing NHSGGC.	ALL SCREENING	- Corporate - Prisons	- Public Health Directorate - Prison Health Care	- Adults involved in the justice system	Monitoring of access to screening programmes.	2019 onwards

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
10. Support the implementation of the National Prison Healthcare Network recommendations for engagement with the population screening programmes in the prison setting	ALL SCREENING	Prisons	- Public Health Directorate - Prison Health Care	- Adults involved in the justice system	Opportunistic and systematic access to screening programmes.	2019-20
11. Work with third sector to support and promote screening programmes.	ALL SCREENING	- Community	- Health Improvement Teams - CRUK - Jo's Cervical Cancer Trust - Bowel Cancer Scotland	All	Better partnership working	2019-21
12. Clarify service specification on programme re GMS contract.	CERVICAL	- Primary Care	- Primary Care Development - Public Health Directorate and HSCPs	All	Negotiation with primary care is informed by national and local agreements.	2019-20

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
13. Introduce a steering group process to link the analysis of demographic data to ensure campaigns and projects are targeted at areas with the lowest uptake rates or identify where a different course of action may be required.	CERVICAL	Corporate	- Public Health Directorate - All partners	All	Improved understanding of inequalities to inform planning.	2019-20
14. Monitor the impact of the new GMS contract on screening uptake.	CERVICAL	Primary Care	- Public Health Directorate	All	Impact of national changes on uptake are understood and information shared.	2019-20

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
15. Support peer to peer learning for adults with a learning disability in cervical and breast screening in the Clyde Gateway area.	- CERVICAL - BREAST	Community	- NE Health Improvement - People First - Clyde Gateway	Adults with learning disabilities	Increased local (NE) uptake of screening in target population.	2019-21
16. Conduct tests of change in peer learning programme as part of the Clyde Gateway area project.	- CERVICAL - BREAST	Community	- NE Health Improvement - People First - Clyde Gateway - NHS Lanarkshire	Adults with learning disabilities	Identified improvements in service design for adults with learning disabilities	2019-21
17. Test the use of teaser communication via a randomised control trial.	CERVICAL	Corporate	- Public Health Directorate - NHS Lanarkshire - eHealth	Newly eligible young women from deprived areas	4% increase in uptake among trial group with deprivation and HPV status information.	2019-21

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
18. Monitor the impact of HPV vaccination on uptake of screening programme.	CERVICAL	Corporate	- Public Health Directorate	All	Improved understanding of impact of vaccination on screening inequalities.	2019-21
19. Review and update cervical screening toolkit following primary care staff focus groups.	CERVICAL	Primary Care	- Primary Care Development - Jo's Cervical Cancer Trust - Cancer Research UK	All priority groups	Improved engagement and screening practice.	2019-20
20. Test of change: Increase appointment availability outwith standard office hours	CERVICAL	Primary Care	- Primary Care Development - Jo's Cervical Cancer Trust - Sandyford - Clyde Gateway	Women who have not engaged	Evidence whether appointment flexibility (out of hours) increases uptake for women who are non-attenders.	2019-21

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
21. Develop content and deliver staff learning and development to GP practice staff.	CERVICAL	Primary Care	- Practice Development - Jo's Trust - Cancer Research UK - Bowel Cancer UK	All	Improved experience of screening.	2019-21
22. Provide opportunities for third sector organisations to contribute to NHS staff training.	CERVICAL	Primary Care	- Practice Development - Jo's Trust - Cancer Research UK	All	Improved understanding of community impact on uptake.	2019-21
23. Provide targeted education to groups with lower uptake status.	CERVICAL	Community	- Health Improvement teams - Jo's Cervical Cancer Trust - People First	- Women from minority ethnic groups - Young women - Women over 50 - Women from deprived areas - Women with learning disabilities	More informed about screening and how to access local screening opportunities.	2019-20
24. Teaser letters for bowel screening	BOWEL	System	- Public Health Directorate	Adults who live in socio-economically deprived areas plus men.	Improved uptake.	2019-20

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
25. Monitor the impact of FIT on uptake of screening programme.	BOWEL	Primary Care	- Public Health Directorate	All	Improved understanding of impact of test on screening inequalities.	2019-21
26. Conduct tests of change in West Dunbartonshire	BOWEL	- Primary Care - LD services - Community	- HSCP Health Improvement team	Adults with learning disabilities	Improved local uptake of bowel screening in target population.	2019-21
27. Support primary care awareness of FIT and symptomatic FIT	BOWEL	- Primary Care	- Cancer Research UK	All	Improved capacity to discuss bowel screening with patients and make appropriate referrals for those with symptoms.	2019-21
28. Support GPs to use a test of change approach to promote bowel screening uptake.	BOWEL	- Primary Care	- Cancer Research UK	All	Improved uptake.	2019-21

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
29. Assess feasibility of programme of service and community development where uptake is low.	BREAST	- Primary Care - Community	- West of Scotland - Cancer Research UK - Public Health Directorate and HSCPs	Govanhill community	- Improved uptake from those from BME communities. - Improved uptake from those from BME communities.	2019-20
30. Support breast screening visits for women with disabilities.	BREAST	- Community - Service level	- Renfrewshire HSCP	People with disabilities	- Improved uptake from those with disabilities.	2019-20
31. Routinely send a list of clinic venues with all initial invitation letters, so that people are aware that can change venue.	- BREAST - AAA - DIABETIC RETINOPATHY	- Service level	- West of Scotland Breast Screening Service - AAA & DRS Screening Service	All	Improved uptake.	2019-21

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
32. Implement the evidence based recommendations from Public Health England to reduce inequalities.	AAA	- All NHS settings - Community	- Screening service - Primary Care Development - Public Health Directorate	All	Improved uptake.	2019-21
33. Increase awareness of programmes in primary care and in the most deprived communities	-AAA -DIABETIC RETINOPATHY	- Primary Care - Community	- Public Health Directorate and HSCPs	People living in deprived areas.	Increased uptake.	2019-21
34. Analyse uptake by deprivation through data-zone mapping	DIABETIC RETINOPATHY	- Corporate	- Screening service - Public Health Directorate and HSCPs	People living in deprived areas.	Information to support planning.	2019-21

ACTION	PROGRAMME	SETTING	WHO	PROTECTED CHARACTERISTIC / MARGINALISED GROUP	INTENDED OUTCOME	TIMESCALE
35. Scope out potential to resource health improvement support at screening facilities.	DIABETIC RETINOPATHY	- Screening Service	- Screening service - Public Health Directorate and HSCPs	All	Improved health.	2019-21
36. Work with RNIB to promote DRS	DIABETIC RETINOPATHY	- Community	- RNIB - Screening service - Public Health Directorate and HSCPs	All, People with disabilities	Increased uptake.	2019-21
37. Support GP practices to use of SCI diabetes and accurately code patients	DIABETIC RETINOPATHY	- Primary Care	- Primary Care Development	All, People with disabilities	Quality improvement Improved accuracy of data.	2019-21