| | |
|---|---|
| **PWYLLGOR ADNODDAU CYNALIADWY** **SUSTAINABLE RESOURCES COMMITTEE** | |
| **DYDDIAD Y CYFARFOD:** **DATE OF MEETING:** | 28 February 2023 |
| **TEITL YR ADRODDIAD:** **TITLE OF REPORT:** | Value Based Health Care |
| **CYFARWYDDWR ARWEINIOL:** **LEAD DIRECTOR:** | Professor Philip Kloer, Medical Director and Deputy Chief Executive |
| **SWYDDOG ADRODD:** **REPORTING OFFICER:** | Mr Simon Mansfield, Head of Value Based Healthcare and Dr Leighton Phillips, Director of Research, Innovation and University Partnerships |

| |
|---|
| **Pwrpas yr Adroddiad** (dewiswch fel yn addas) **Purpose of the Report** (select as appropriate) |
| Er Sicrwydd/For Assurance |

**ADRODDIAD SCAA**
**SBAR REPORT**

**Sefyllfa / Situation**

This report is being presented to the Sustainable Resources Committee (SRC) to provide an update on progress with the plan for delivering our Value Based Health Care (VBHC) plan, which has been developed in line with Planning Objective 6D. Planning Objective 6D describes the routine capture of patient reported outcome measures (PROMs) in selected service areas, the delivery of a VBHC education programme and a bespoke programme of research and innovation.

This report will be supported by a presentation, which will outline the work and impact of the Hywel Dda University Health Board (HDdUHB) VBHC Programme.

The SRC is asked to review the progress that has been made against Planning Objective 6D and to take assurance from this report.

**Cefndir / Background**

The HDdUHB approach to VBHC is founded upon the principles of Prudent Healthcare and focuses the development of sustainable healthcare by focusing resources on the outcomes that matter most to our population. This also means that HDdUHB identifies and stops investing in those things that are of limited or no value when considering patient outcomes.

As the SRC are aware, we have published a clear plan for delivering VBHC, which places our population at the heart of our service development. The plan is structured around three interrelated goals:

1. Invest in the systems and processes to enable our staff to routinely use PROMs and resource utilisation data in planning, organising and delivering healthcare.
2. Develop the knowledge and skills of our staff to put the theory of VBHC into practice
3. Establish partnerships with universities, innovation agencies, international healthcare systems and companies to understand how to optimise the wider societal benefits of adopting a VBHC approach and accelerate the innovations with demonstrable potential to securing them

Over the course of the last 12 months, the HDdUHB VBHC Programme has increased in scope and pace, providing routine PROM collection in a large range of service areas.   Looking forward, there remains a realisable ambition to further expand the reach of VBHC routinely into Primary, Community and Social Care.

In recognition of the challenging technical demands imposed by the ambitious approach to VBHC in HDdUHB and in line with national procurement frameworks, work is underway to review technical solution and digital enablers to increasing the impact of VBHC across the entirety of our Health Board.

Our work to date has resulted in detailed reviews of service areas and the development of work plans to change the way that we deliver services, through the lens of value. These Service Reviews have identified a range of common themes, most notably:

- Health literacy and Public Health / Primary Care engagement
- Patient activation and behavioural insights
- Modifiable lifestyle factors including lifestyle clinics and prehabilitation

Work is now underway to finalise the work programme for FY 2023/24 ensuring that there is sufficient pace in key services to make a meaningful difference to the outcomes achieved by our population.

This report updates on progress against each of the three goals since the previous update to SRC.

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## Asesiad / Assessment

This section provides a summary of progress against the three strategic goals and the VBHC Programme Plan, included as Appendix A.

### Goal 1:
**Invest in the systems and processes to enable our staff to routinely use patient reported outcomes and resource utilisation data in planning, organising and delivering healthcare.**

A key element of VBHC driven change within the Health Board is the routine collection of PROMs. Through the DrDoctor digital PROM collection platform, HDdUHB achieved the highest numbers of PROM Assessment Completions across the 35 NHS organisations using the platform in the UK during October and November 2022. This level of PROM data collection has provided a rich vein of information that helps us to uncover insights and facilitate service improvement.

Total PROM/patient reported experience measures (PREM) completion to date:**28k**
Unique patients contacted:**21k**
Forms assigned to date:**84k**
Form notifications sent: **68k**
Form reminders sent:**30k**
Completion rate:**34%**

In addition to the collection of PROM data, the VBHC Team in conjunction with the Data Science department, has developed comprehensive data analytic reports for eight service

areas, examples of which can be found at Appendix B. These reports provide a cohort level summary of PROM data and can illustrate generalised trends and inequities in service delivery through the lens of patient reported outcomes.

The VBHC Programme Plan describes the completion of 9 Service Reviews by the end of March 2023 in the following areas to inform the 2023/24 Planning Cycle:

- Heart Failure
- Trauma and Orthopaedics (T&O), Hips and Knees
- T&O, Shoulders and Elbows
- Diabetes
- Colorectal Cancer
- Lung Cancer
- Chronic Pain
- Lymphoedema
- Cellulitis Improvement Programme

Progress against this plan has been positive with 6 of the 9 Service Reviews having already been completed and the remaining 3 to be completed before the end of the financial year.

The Service Review plan has been delivered according to plan with the following exceptions:

- The Service Review process in T&O Hips and Knees has not yet resulted in an actionable plan and requires further engagement to develop this.
- The Lung Cancer Service Review planned for December 2022 has been delayed until March 2023 due to a change in key service personnel.

Although there have been technical challenges that have delayed the development of some visualisation dashboards, these issues have now been largely resolved and a revised schedule of dashboard rollouts has been developed. It should be noted that the delay in dashboard rollout does not impact the completion of Service Reviews.

A summary of the progress against each of these specialty areas in included below

**Trauma & Orthopaedics**
**Hips and Knees**

| PROM collection | 1,340 PROM collections completed | |
|---|---|---|
| Resource Analysis | Completed | |
| Analytic Report | Analytic Reports completed for both Hips and Knees | |
| Dashboard | Dashboard delayed to February 2023 due to limb laterality identification in the API issue | Delayed |
| Service Review | Service Review undertaken 30/09/22, second review postponed | Delayed |

As noted, the initial Service Review was undertaken in September 2022, but requires further engagement with clinical teams in February 2023 to re-frame the actions that can be taken forwards through the lens of Value.

**Trauma & Orthopaedics**
**Shoulder and Elbows**

| PROM collection | 1,599 PROM collections completed | |
|---|---|---|
| Resource Analysis | Completed | |
| Analytic Report | Analytic report completed for both Shoulder and Elbows | |

| Dashboard | Dashboard delayed to February 2023 due to limb laterality identification in the API issue | Delayed |
|---|---|---|
| Service Review | Service Review undertaken 23/09/22, action plan developed | |

## Diabetes

| PROM collection | 1,332 PROM collections completed | |
|---|---|---|
| Resource Analysis | Resource analysis due in October in advance of service review | |
| Analytic Report | Analytic report due 14th October (due September) | |
| Dashboard | Due in February 2023 - delayed pending imminent completion of T&O dashboards | Delayed |
| Service Review | Service Review undertaken 20/10/22 & 28/10/22 action plan developed | |

## Colorectal Cancer

| PROM collection | 177 collections to date | |
|---|---|---|
| Resource Analysis | Due in October 2022 | |
| Analytic Report | Analytical report completed | |
| Dashboard | Due in March 2023, delayed pending imminent completion of T&O dashboards | Delayed |
| Service Review | Service Review undertaken 15th November, action plan to be developed in February 2023 | |

## Lung Cancer

| PROM collection | 771 collections on National Platform, 187 collections on DrDoctor platform since 9th September 2022. | |
|---|---|---|
| Resource Analysis | Due November 2022 | |
| Analytic Report | Delayed to March 2023 from November 2022 | Delayed |
| Dashboard | National dashboard live, plan for local Power BI dashboard to be developed in February 2022 - delayed pending imminent completion of T&O dashboards | |
| Service Review | Service Review planned for 8th & 15th December 2022 – delayed due to staffing pressures and unavailability of key individuals. Rescheduled date to be agreed. | Delayed |

Further technical work is required to assimilate national and local PROM data sets and has delayed the production of the analytic report.

## Chronic Pain

| PROM collection | 876 Biopsychosocial collections, 86 Biopsychosocial post collections, 67 Medical pathway collections | |
|---|---|---|
| Resource Analysis | Due December 2022 – resource analysis due in advance of the service review | On track |
| Analytic Report | Due December 2022 | |
| Dashboard | Due in March 2023 - delayed pending completion of T&O dashboards | Delayed |
| Service Review | 27th January 2023 / 3rd February 2023 | On track |

## Lymphoedema

| PROM collection | 1,799 PROM and 935 PREM collections to date | |
|---|---|---|
| Resource Analysis | Resource analysis completed meeting with service 03/11/22 | |
| Analytic Report | Completed | |
| Dashboard | Due to be completed in February 2023 | On track |
| Service Review | Service Review delayed from February and scheduled for 2nd March | On track (revised) |

## Cellulitis

| | | |
|---|---|---|
| PROM collection | 62 completions made to date | |
| Resource Analysis | Due in February 2023 – to be reviewed based upon collection numbers | On track |
| Analytic Report | Due in January 2023 | On track |
| Dashboard | February 2023 | On track |
| Service Review | Service Review delayed from February and scheduled for 2nd March | On track (revised) |

**Impact**

Pleasingly, we are starting to witness the impact that taking a VBHC approach is having.  Our work on Heart Failure has led to:

- Appointment of Lead Heart Failure Nurse, bringing together Clinical Nurse Specialists across all counties into a coherent group for the first time
- Implementation of novel one-stop diagnostic Heart Failure clinics
- Improved diagnostic pathway
- 40% reduction in acute Heart Failure admissions, full year effect would be bed day activity in excess of £986,000
- 28% reduction in average time for Acute Coronary Syndrome patients to be transferred to tertiary centre for investigation/treatment

**Goal 2:**
**Develop the knowledge and skills of our staff to put the theory of VBHC into practice**

As previously reported, our focus has now moved from a high level education programme to an 'applied practitioner programme', which is focused on delivery quantifiable impact in the following areas:

- Inflammatory Bowel Disease
- Chronic Pain Service
- Chest Pain Clinic
- Mobile Respiratory Unit
- Same Day Emergency Care
- Pembrokeshire Falls
- Enhanced Recovery After Surgery

The current programme completes in March 2023.  A report will be provided to the next SRC covering impact from these focused project areas.

Further work is now being undertaken jointly with the National Value in Health Centre, the Finance Academy and other Health Boards to coordinate the delivery of high quality and equitable VBHC educational offerings across NHS Wales.

**Goal 3:**
**Establish partnerships with universities, innovation agencies, international healthcare systems and companies to understand how to optimise the wider societal benefits of adopting a VBHC approach and accelerate the innovations with demonstrable potential to securing them**

As part of Goal 3, the partnerships with universities has encompassed the linkage with PhD students in Bangor University, who are connecting their work through supervision arrangements (Assistant Director of Finance) to the delivery of VBHC within HDdUHB.

While the research questions are still being refined, they are likely to focus on workforce sustainability and the challenge of investing in early intervention and prevention.

Work has also commenced to develop a model to guide VBHC agreements with industry. A workshop was held with healthcare, financial, and academic experts in January 2023 to develop a model and the model will be tested in the Spring.

Discussions have also progressed around establishing a VBHC 'learning partnership' with the healthcare system in Victoria, Australia. Further updates will be provided to SRC throughout 2023.

## Key Risks
The VBHC Programme risk register has recently been migrated onto the DATIX system, covering all issues that could delay programme delivery. Risks are routinely monitored through the VBHC Management Group. A summary of the most significant risks on the register is included below:

There is one risk scored as 16
There are two risks scored as 12
There is one risk scored as 8

### Risk #1496 – digital capacity to develop PROM dashboards (12)
This risk remains active and although the Heart Failure dashboard has been developed and is available to service users, further dashboards have not been completed, and visualisations requested by clinical leads are not immediately available. In order to ensure the controlled rollout of PROM dashboards is managed for the coming year, the work programme is being co-developed by the HDdUHB VBHC and Informatics Teams.

### Risk #1499 – Investments made in VBHC may not result in measurable service improvements (12)
While the investments made in capturing PROM and PREM data may take considerable time to provide insight to services and measurable service improvements. Following considerable investment in Cardiovascular services through the lens of Value, we are now observing measurable service improvements that are exceeding initial predictions in Heart Failure and Acute Coronary Syndrome patients. Alongside the ongoing VBHC work programme, further work is being progressed to specifically consider the waste in current pathways using LEAN principles. This additional programme of work will rapidly identify and remove waste from pathways, enabling resources to be used in providing higher value interventions elsewhere.

### Risk #1501 – PROM collections in mixed clinics (8)
Issues identified previously with PROM collections in mixed clinics have been resolved through changing clinic structures and also by using the digital PROM collection solution to only open specific question sets where appropriate. This risk will now be closed.

### Risk #1502 – Risk to the delivery of the AF project (16)
Due to limited uptake in Primary Care practices, the AF opportunistic screening project has been re-planned with clinical colleagues and submitted to Welsh Government for approval. Risk to be re-evaluated once approval has been

## Programme Finances
The Welsh Government invests £1.8m per annum in HDdUHB to deliver its VBHC programme. A paper was presented to Use of Resources Group regarding how this investment will be

utilised.  In summary the paper described the distribution of resources between the following areas:
- VBHC Team
- Education Programme
- Digital PROM/PREM collection platform
- VBHC Delivery Fund to support short term value

Furthermore, the paper described the governance and process that underpins the application to access the VBHC Delivery Fund, the approval mechanism and the process for delivering and evaluating the outputs of this work.

**Argymhelliad / Recommendation**

The Sustainable Resources Committee is asked to receive assurance from our plan to deliver the goals contained with the document 'Our Approach to Value Based Health Care'

The Sustainable Resources Committee is also asked to note the progress of the VBHC Programme and to note the key risks to programme delivery and the scores assigned to them.

| Amcanion: (rhaid cwblhau) Objectives: (must be completed) | |
|---|---|
| Committee ToR Reference: Cyfeirnod Cylch Gorchwyl y Pwyllgor: | Seek assurance on delivery against all Planning Objectives aligned to the Committee, considering and scrutinising the plans, including the medium term financial plans, savings plans and decarbonisation plans, that are developed and implemented, supporting and endorsing these as appropriate |
| Cyfeirnod Cofrestr Risg Datix a Sgôr Cyfredol: Datix Risk Register Reference and Score: | Not Applicable |
| Safon(au) Gofal ac Iechyd: Health and Care Standard(s): | All Health & Care Standards Apply |
| Amcanion Strategol y BIP: UHB Strategic Objectives: | All Strategic Objectives are applicable |
| Amcanion Cynllunio Planning Objectives | 6D_22 Value Based Healthcare and Patient Reported Outcome Programme |

| | |
|---|---|
| Amcanion Llesiant BIP:<br>UHB Well-being Objectives:<br>Hyperlink to HDdUHB Well-being Objectives Annual Report 2018-2019 | 9. All HDdUHB Well-being Objectives apply |

| Gwybodaeth Ychwanegol:<br>Further Information: | |
|---|---|
| Ar sail tystiolaeth:<br>Evidence Base: | Annual Report of the Chief Medical Officer 2018/19 |
| Rhestr Termau:<br>Glossary of Terms: | Included within the body of the report. |
| Partïon / Pwyllgorau â ymgynhorwyd ymlaen llaw y Pwyllgor Ceisiadau Gofal Sylfaenol:<br>Parties / Committees consulted prior to Sustainable Resources Committee: | Finance Committee<br>VBHC Management Group<br>VBHC Strategic Enabling Group<br>National Value in Health Community of Practice |

| Effaith: (rhaid cwblhau)<br>Impact: (must be completed) | |
|---|---|
| **Ariannol / Gwerth am Arian:**<br>**Financial / Service:** | A VBHC Business Case has been submitted and approved by the Sustainable Resources Committee to support the implementation of a comprehensive VBHC Programme.<br><br>In addition to this Business Case, project plans are being constructed for individual services and pathway areas. These plans culminate in a Service Review process that considers the resources consumed in delivering services against the outcomes achieved by patients. The insights and proposed changes may impact all elements of a service both in pay and non pay and are built upon the principles of Prudent Healthcare. |
| **Ansawdd / Gofal Claf:**<br>**Quality / Patient Care:** | VBHC is designed to improve outcomes and the use of resources in delivering them. It is also driven by prudent healthcare principles drive the delivery of equitable services across the Health Board. |
| **Gweithlu:**<br>**Workforce:** | Individual teams and resources are considered as a part of the VBHC review of services, but recommendations are owned by service areas. |
| **Risg:**<br>**Risk:** | VBHC Programme risk assessment has been completed, however individual project areas are subject to their own project structures with risk assessment being an integral component. |
| **Cyfreithiol:**<br>**Legal:** | None |
| **Enw Da:**<br>**Reputational:** | None |

| Gyfrinachedd: Privacy: | Privacy Impact Assessment has been completed for PROM and PREM capture as part of the VBHC Programme. |
|---|---|
| Cydraddoldeb: Equality: | Equality Impact Assessment completed. |

# Appendix A – VBHC Programme Plan

| Pathway/Specialty Area | Aug | Sep | Oct | Nov | Dec | Jan |
|---|---|---|---|---|---|---|
| **Live Collection** | | | | | | |
| Heart Failure | | | | | | |
| T&O Hips and Knees | | ● | * | ● | | |
| T&O Shoulders and Elbows | ● | | * | ● | | |
| Orthopaedic Prehab | | | | | | |
| Opthalmology - AMD | | | | ● | | |
| Chronic Pain Service (Medical and non medical) | | | | | | |
| Lymphoedema | | ● | | | | |
| Cellulitis Improvement Programme | | | | | ● | |
| Urology - Trial Without Catheter (TWOC) | | | | | | |
| Lung Cancer | | | | ● | | |
| Long Covid Service | | | | | ● ● | |
| Dietetic Led IBS Service | | | | | | |
| Diabetes | | | ● ● | ● * | | |
| RIW Respiratory Mobile Unit | | | | | | |
| Rapid Diagnostic Clinic | | | | | | |
| Colorectal Cancer | | ● | ● ● | * | | |
| MSK Physiotherapy | | | | | | |
| **Active/In progress** | | | | | | |
| Dermatology | | | | | | |
| Endometriosis | | | | | | |
| Care Homes | | | | | | |
| Diabetes - Podiatry | | | | | | |
| Cataracts | | | | | | |
| Unpaid Carers/ FLO | | | | | | |
| **Upcoming Areas - being scoped** | | | | | | |
| Health Psychology | | | | | | |
| Atrial Fibrillation | | | | | | |
| IBD | | | | | | |
| Asthma | | | | | | |
| Woman and Child Health (Maternity) | | | | | | |
| Inguinal Hernia | | | | | | |
| Adult Mental Health | | | | | | |
| Gastroenterology | | | | | | |

| Key | |
|---|---|
| | In Progress - Project underway, Pathway mapping |
| | LIVE |
| ○ | Analysis - Dashboard |
| | Service Review |
| | PROM/PREM Capture ongoing |
| | Collection Paused |
| ○ | Resource utilisation review |
| | Project paused |
| | Operational implementation |
| ○ | Deep dive/analytic - to stocktake and inform service reviews |

# Colorectal PROM Report

Data.ScienceHDD@Wales.nhs.uk (mailto:Data.ScienceHDD@Wales.nhs.uk)

02 November 2022

# 1 Introduction

This report provides summary tables and visualisations based on a data set of 124 records (123 distinct patients) from the Colorectal Patient Reported Outcome Measures (PROMs) data for the period 03 July 2022 to 11 October 2022, where dates represent the PROMs forms' completion dates.

The purpose of this report is to contextualise the demographic of patients in a concise and aesthetic manner, while also providing insight regarding the cohort of patients and their reported outcomes.

All assumptions and transformative manipulations made to the data will be presented transparently throughout this report, adjacent to the respective visualisations that are affected by these assumptions/transformations.

Please also note that the plots in this report are interactive, with the the exception of the correlation plots (Section 4.8).

# 2 Caveats and Constraints

There is a degree of incompleteness to elements of the data, records have been omitted (as specified throughout) from certain tables and visualisations where necessary.

It does not appear as though data for age/date of birth, treatment location (i.e. site or county), or residence have been collected. Efforts to link data via patients' NHS Number have been made, but there is likely a degree of error in this with respect to the linkage methodology available.

Data has been grouped, in this instance, in a manner deemed logical by the developer. This may not be the optimal way to group or present this information; feedback and suggestions are very welcome, and in future iterations of this work these improvements can hopefully be implemented. Specifically, please note the grouping of patients by their intervention status' (Living with a stoma bag, rectal surgery performed, neither intervention, both interventions).

# 3 Patient Demographics

The following table and visualisations offer insight into patient demographics:

## 3.1 Patient Gender, Age Group and Intervention Status

| Characteristic | Neither, N = 55[1] | Rectal Surgery, N = 26[1] | Stoma Bag, N = 20[1] | Both, N = 17[1] |
|---|---|---|---|---|
| **Gender** | | | | |
| Female | 18 (33%) | 12 (46%) | 4 (20%) | 4 (24%) |
| Male | 37 (67%) | 14 (54%) | 16 (80%) | 13 (76%) |
| **Age (years)** | 68.2 (10.2) | 67.8 (10.9) | 71.7 (10.5) | 68.4 (10.6) |
| **Age Group** | | | | |
| 18-24 | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| 25-34 | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| 35-44 | 1 (1.8%) | 0 (0%) | 0 (0%) | 1 (5.9%) |
| [1] n (%); Mean (SD) | | | | |

| Characteristic | Neither, N = 55[1] | Rectal Surgery, N = 26[1] | Stoma Bag, N = 20[1] | Both, N = 17[1] |
|---|---|---|---|---|
| 45-54 | 5 (9.1%) | 4 (15%) | 2 (10%) | 1 (5.9%) |
| 55-64 | 11 (20%) | 5 (19%) | 3 (15%) | 2 (12%) |
| 65-74 | 24 (44%) | 9 (35%) | 7 (35%) | 10 (59%) |
| 75-84 | 12 (22%) | 6 (23%) | 5 (25%) | 2 (12%) |
| 85+ | 2 (3.6%) | 2 (7.7%) | 3 (15%) | 1 (5.9%) |

[1] n (%); Mean (SD)

## 3.2 Patient Residence by Local Authority
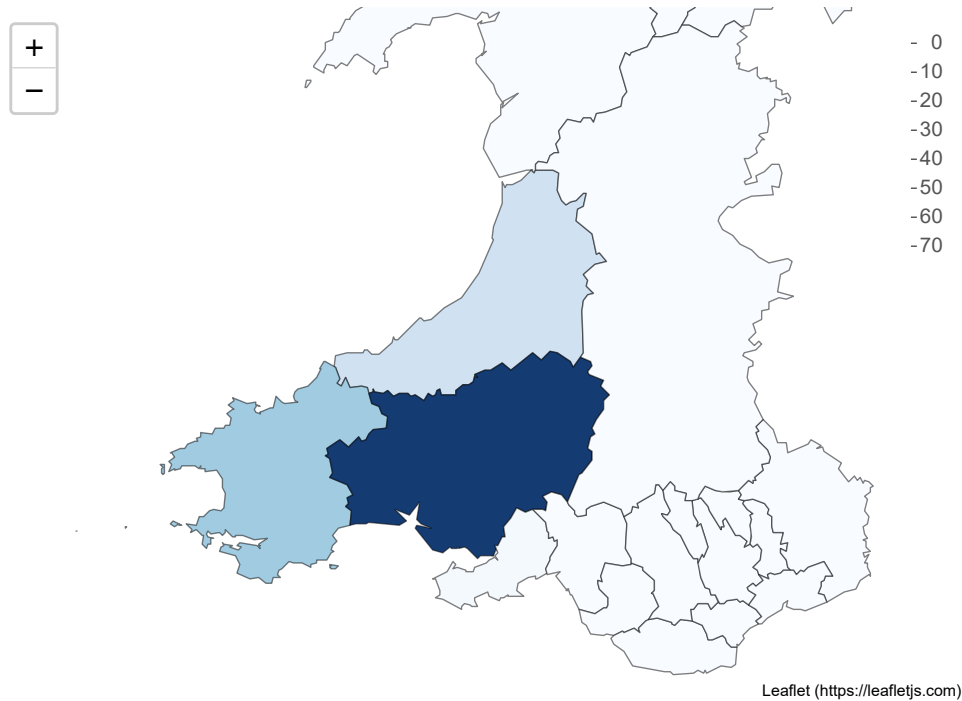
Patient residence location is based on linkage to recent inpatient records.

Based on 122 of 124 records. This visualisation excludes two records that have been omitted due to data linkage issues.



Leaflet (https://leafletjs.com)

## 3.3 Patient Residence by Middle Layer Super Output Area

Patient residence location is based on linkage to recent inpatient records.

Based on 122 of 124 records. This visualisation excludes two records that have been omitted due to data linkage issues.

## 3.4 Patient Residence County and Treatment County Flow

Patient residence location is based on linkage to recent inpatient records. Treatment County was not recorded in the PROMs data set, so has been derived from recent inpatient records. Consequently, some records may be unrepresentative of colorectal treatment location and could be representative of treatment for other conditions.

Based on 122 of 124 records. This visualisation excludes two records that have been omitted due to data linkage issues.
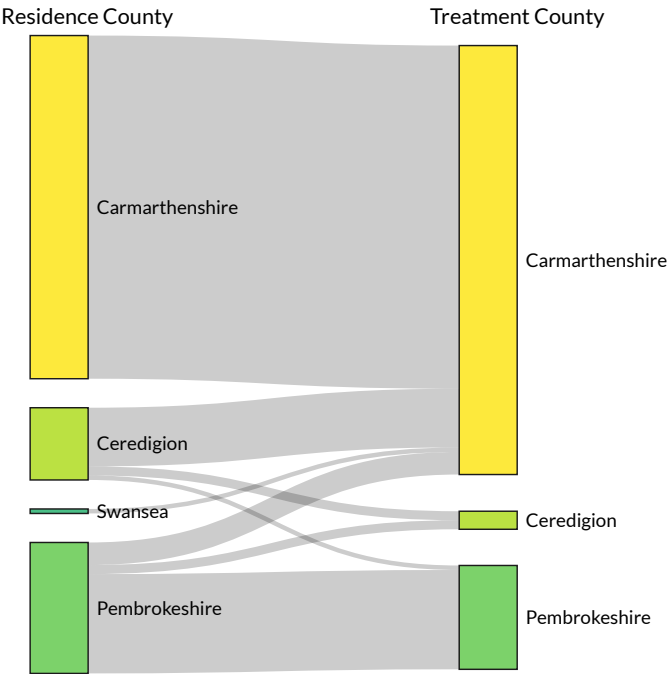


## 3.5 Responses by Gender

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

Of the 119 records presented in this table, 81 (68.1%) were attributed to male patients while 38 records (31.9%) were attributed to female patients.

The following table provides the count of records by gender and surgery/stoma bag status:

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| Gender | Neither | Rectal Surgery | Stoma Bag | Both | Total |
|--------|---------|----------------|-----------|------|-------|
| Female | 18 | 12 | 4 | 4 | 38 |
| Male | 38 | 14 | 16 | 13 | 81 |
| Total | 56 | 26 | 20 | 17 | 119 |

Gender
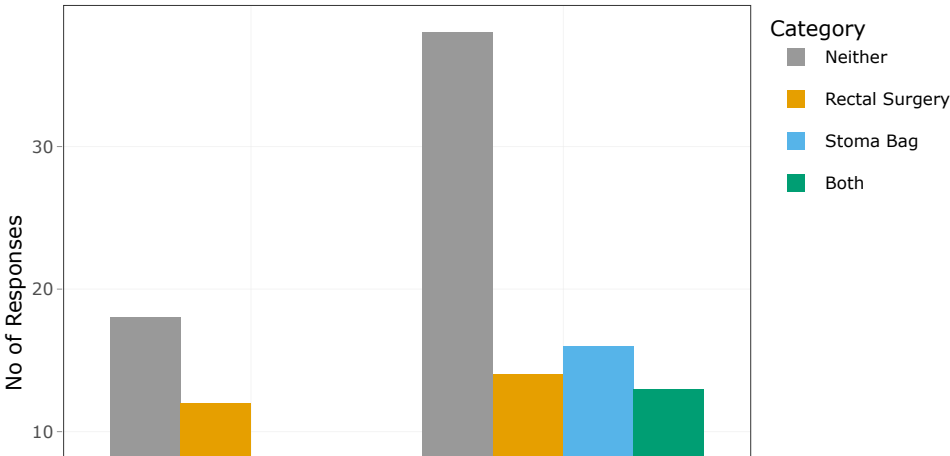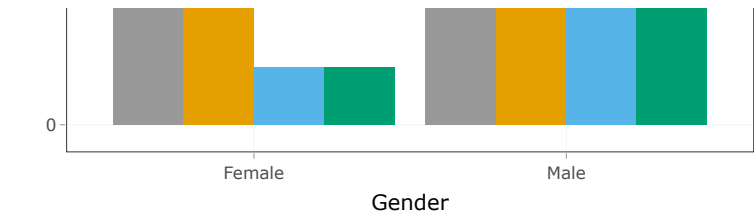
## 3.6 Responses by Age

The following table provides a breakdown of the 119 records analysed in this report by age group banding:

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

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| Age Group | Record Count | Percent of Total |
|---|---|---|
| 35-44 | 2 | 1.6% |
| 45-54 | 12 | 9.8% |
| 55-64 | 21 | 17.2% |
| 65-74 | 51 | 41.8% |
| 75-84 | 28 | 23% |
| 85+ | 8 | 6.6% |
| Total | 122 | 100% |

## 3.7 Responses by Patient Stoma Bag and Rectal Surgery Status

The following table provides a breakdown of the 119 records analysed in this report by age group, stoma bag and rectal surgery status:

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

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| Age Group | Neither | Rectal Surgery | Stoma Bag | Both | Total |
|---|---|---|---|---|---|
| 35-44 | 1 | | | 1 | 2 |
| 45-54 | 5 | 4 | 2 | 1 | 12 |
| 55-64 | 11 | 5 | 3 | 2 | 21 |
| 65-74 | 24 | 9 | 7 | 10 | 50 |
| 75-84 | 13 | 6 | 5 | 2 | 26 |
| 85+ | 2 | 2 | 3 | 1 | 8 |
| Total | 56 | 26 | 20 | 17 | 119 |
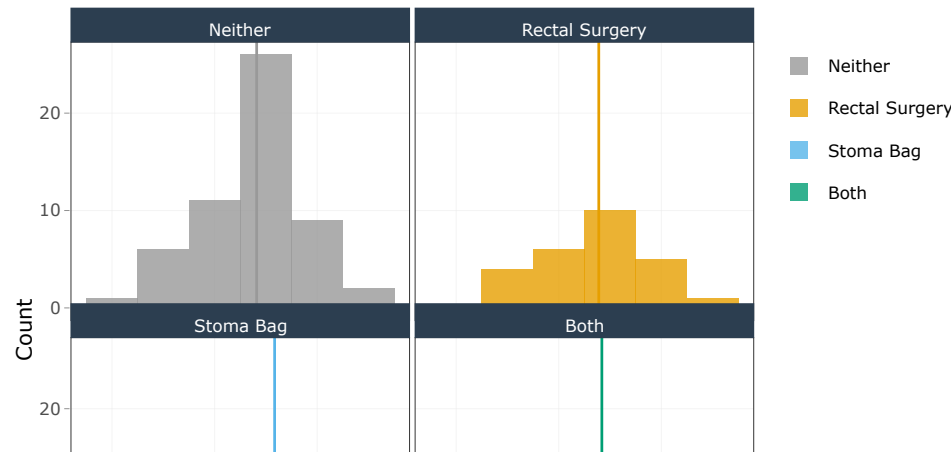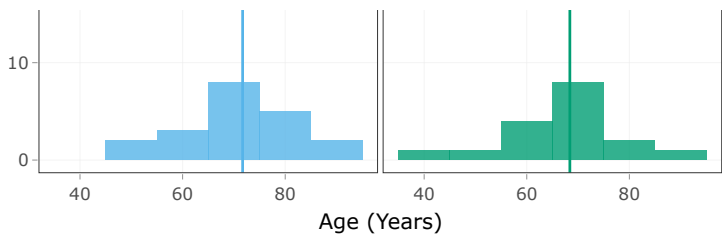
# 4 PROM Analysis

Data has been collected with regards to two Colorectal PROMs.

This section seeks to present the scoring in a number of ways; the objective of which is to provide insight and understanding of the data collected and what it means for Hywel Dda patients.

Each visualisation and table in this section will have two variants, firstly a European Organisation for Treatment of Cancer (EORTC) CR29 variant, and secondly, a Low Anterior Resection Syndrome (LARS) score variant.

## 4.1 EORTC CR29 Score

The EORTC CR29 evaluates the symptoms experienced by a patient in addition to other indicators of wellbeing such as sexual function and body image perception.

Notably, one element of this evaluative methodology exclusively pertains to patients living with a stoma. There are also distinct elements to measure sexual function for each gender.

Scoring is calculated as set out in CR29, with individual responses corresponding to a fixed score; the sum of which is taken to provide an EORTC CR29 score for each patient.

## 4.2 LARS Score

The LARS score aims to evaluate bowel function. Questions evaluate the presence and severity of symptoms including fecal incontinence, irregular (high or low) bowel movement frequency, and more.

Scores range from 0 to 42, with three categories classifying the severity of LARS:

- 0 to 20 indicates no LARS;
- 21 to 29 indicates minor LARS;
- Over 29 indicates major LARS (30-42).

## 4.3 Abbreviated Elements

### 4.3.1 EORTC CR29 Abbreviations

The original questions, and their abbreviated equivalents (for the purposes of visualisation) can be found below:

| Copy | CSV | Excel | PDF | Print |

| Question | Abbreviation |
| --- | --- |
| Did you urinate frequently during the day? | Day time urination |
| Did you urinate frequently during the night? | Night time urination |
| Have you had any unintentional release (leakage) of urine? | Urine leakage |
| Did you have pain when you urinated? | Urination pain |
| Did you have abdominal pain? | Abdominal urination pain |
| Did you have pain in your buttocks/anal area/rectum? | Buttocks/rectum/anal area pain |
| Did you have a bloated feeling in your abdomen? | Bloated abdomen |
| Have you had blood in your stools? | Blood in stools |
| Have you had mucus in your stools? | Mucous in stools |
| Did you have a dry mouth? | Dry mouth |

| Question | Abbreviation |
|---|---|
| Have you lost hair as a result of your treatment? | Hair loss during treatment |
| Have you had problems with your sense of taste? | Problems with sense of taste |
| Were you worried about your health in the future? | Worried about health |
| Have you worried about your weight? | Worried about weight |
| Have you felt physically less attractive as a result of your disease or treatment? | Felt less attractive |
| Have you been feeling less feminine/masculine as a result of your disease or treatment? | Felt less feminine/masculine |
| Have you been dissatisfied with your body? | Dissatisfied with body |
| Have you had unintentional release of gas/flatulence from your stoma bag? | Unintentional gas from stoma bag |
| Have you had leakage of stools from your stoma bag? | Leakage of stools from stoma bag |
| Have you had sore skin around your stoma? | Sore skin around stoma |

## 4.3.2 LARS Abbreviations

The original questions and their abbreviated equivalents which have been used for the purposes of visualisation can be found below:

Copy   CSV   Excel   PDF   Print

| Question | Abbreviation |
|---|---|
| Do you ever have occasions when you cannot control your flatus (wind)? | Difficulty controlling wind |
| Do you ever have any accidental leakage of liquid stool ? | Accidental stool leakage |
| How often do you open your bowels? | Bowel movement frequency |
| Do you ever have to open your bowels again within one hour of the last bowel opening? | Bowel movement recurrence (1hr) |
| Do you ever have such a strong urge to open your bowels that you have to rush to the toilet? | Strong urge requiring rush |

# 4.4 Score Total Distributions

## 4.4.1 EORTC CR29 Score Distribution

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

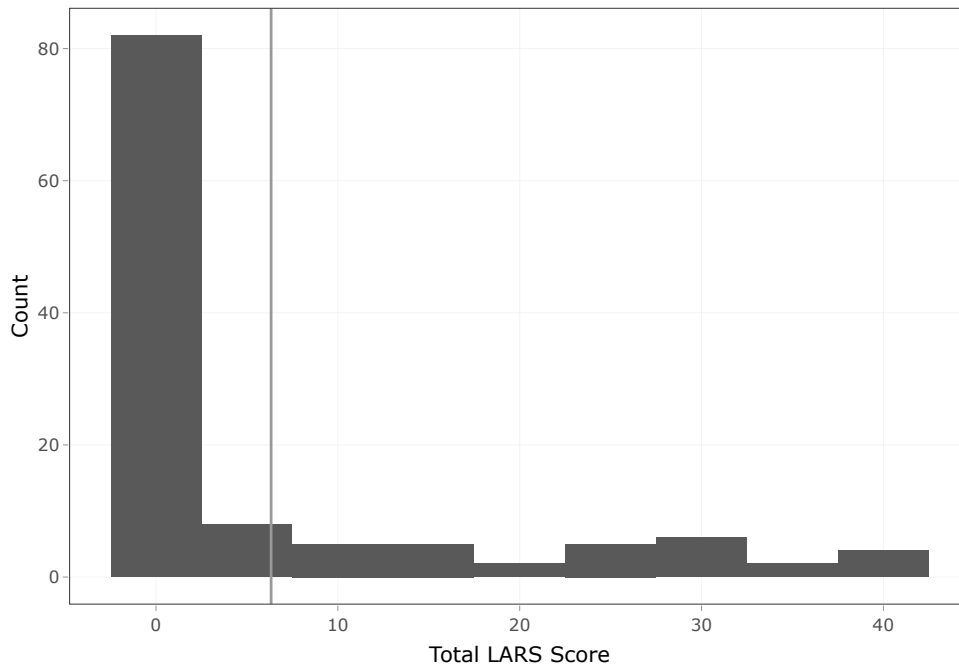The following plot presents the EORTC CR29 score distribution:
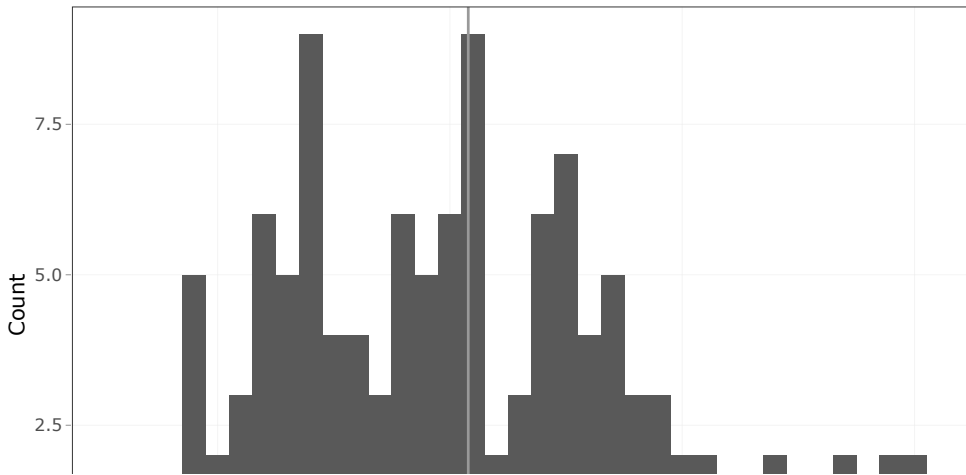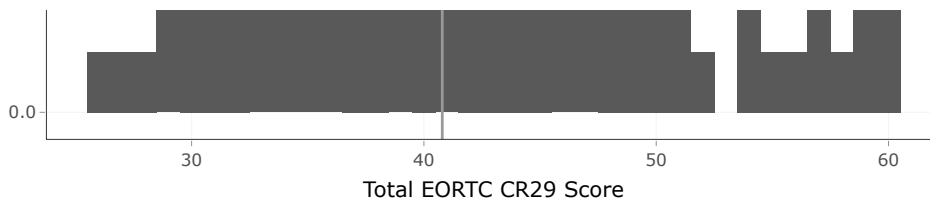
### 4.4.2 LARS Score Distribution

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

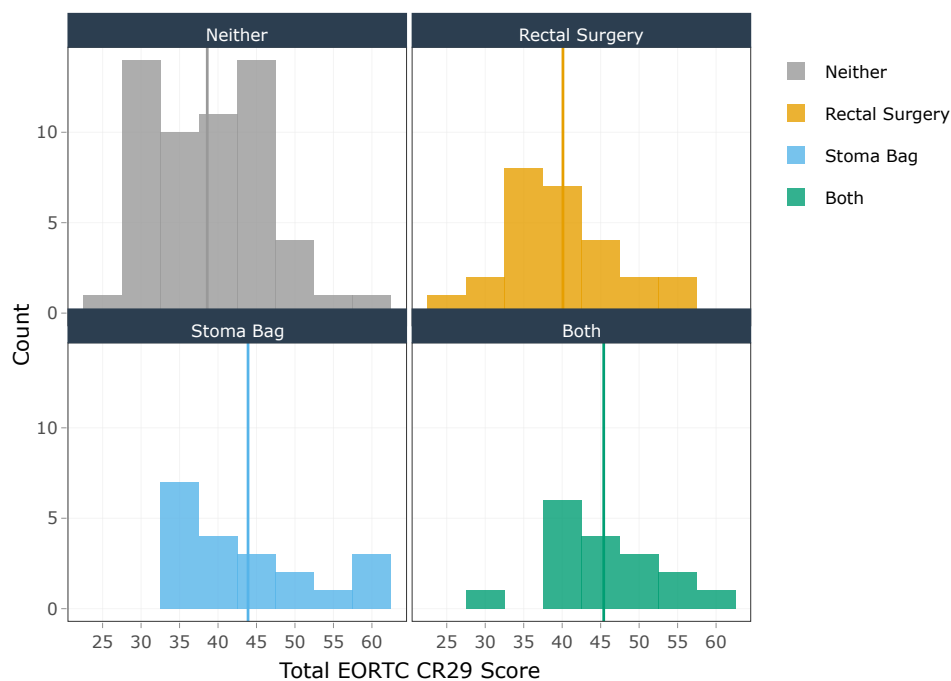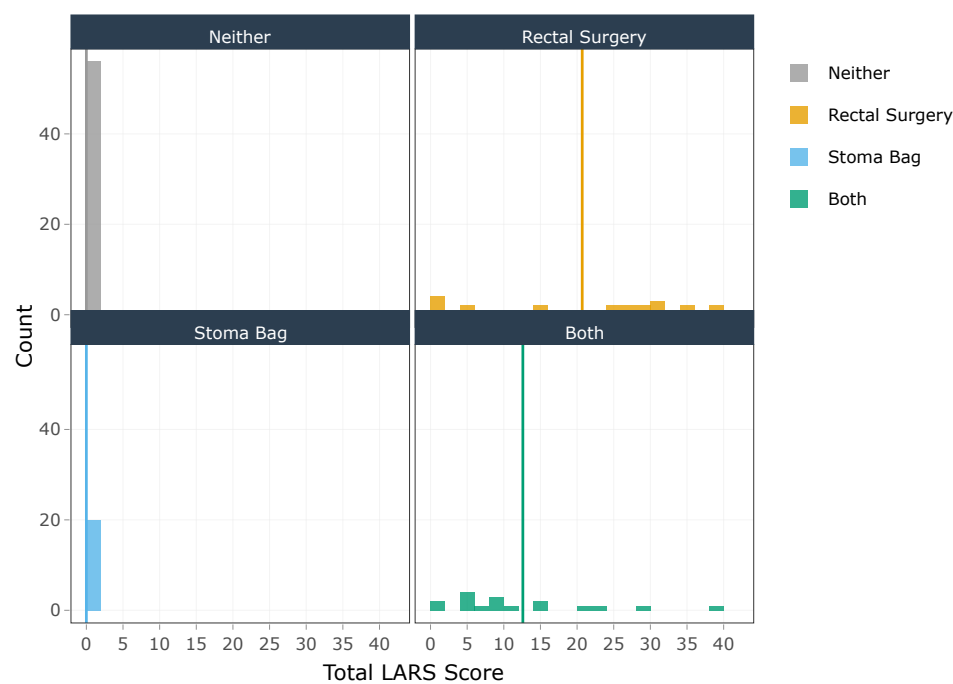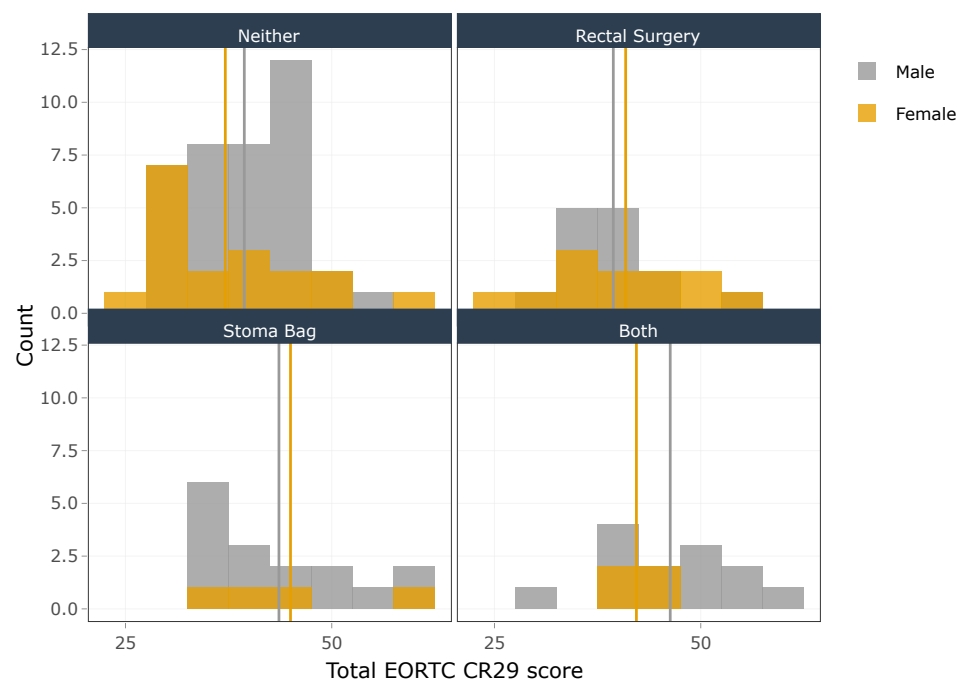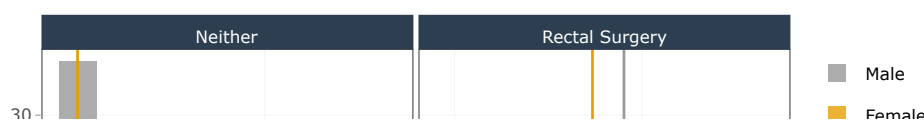The following plot presents the LARS score distribution:



## 4.5 Score Total Distributions by Surgery and Stoma Status

### 4.5.1 EORTC CR29 Score Distribution by Surgery and Stoma Status

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

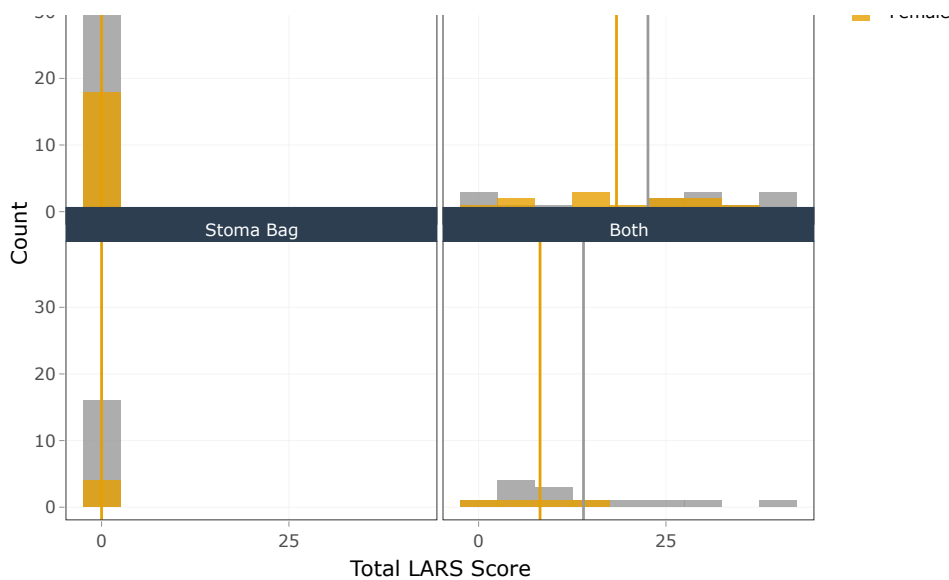The following plot presents EORTC CR29 score distribution, faceted by surgery and stoma status:

## 4.5.2 LARS Score Distribution by Surgery and Stoma Status

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

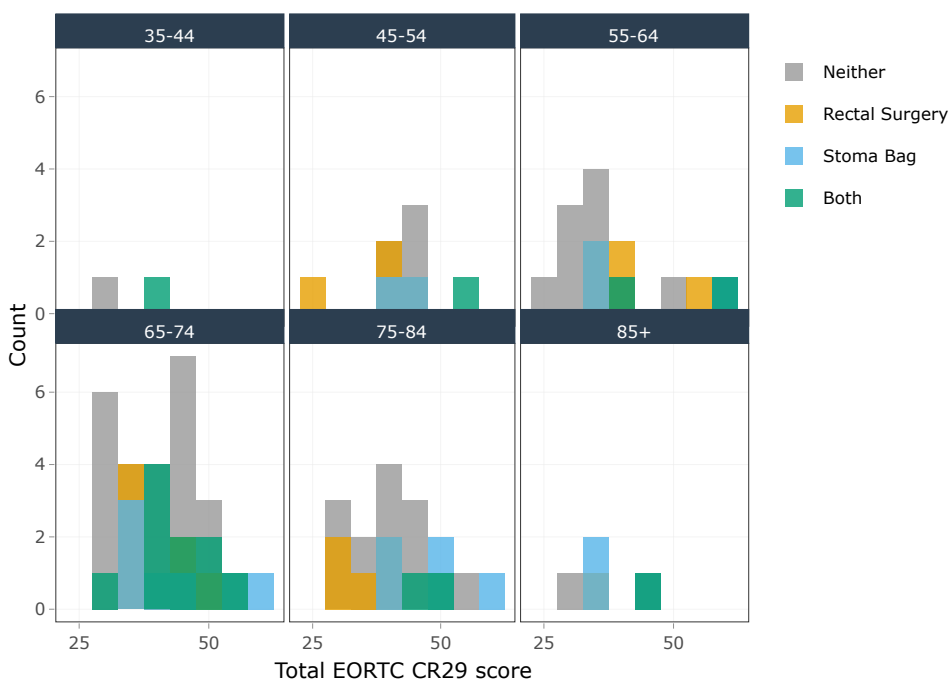The following plot presents LARS score distribution, faceted by surgery and stoma status:



# 4.6 Score Total Distributions by Gender

## 4.6.1 EORTC CR29 Score Distribution by Gender

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

The following plot presents EORTC CR29 score distribution, faceted by gender:



## 4.6.2 LARS Score Distribution by Gender

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

The following plot presents LARS score distribution, faceted by gender:

## 4.7 Score Total Distributions by Age Group

### 4.7.1 EORTC CR29 Score Distribution by Age Group

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.
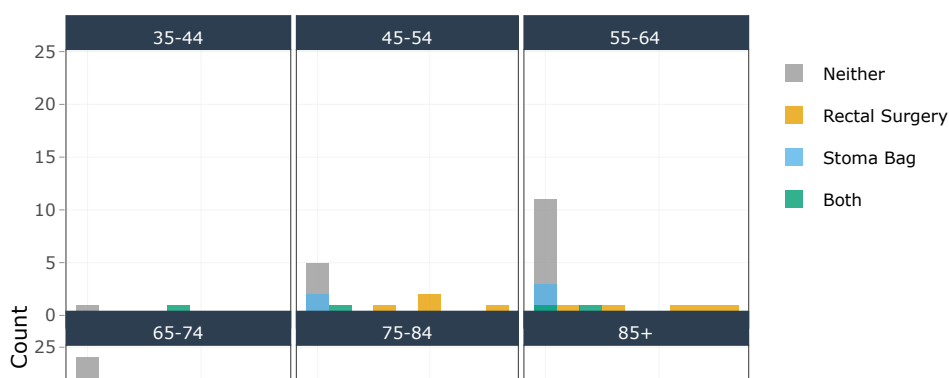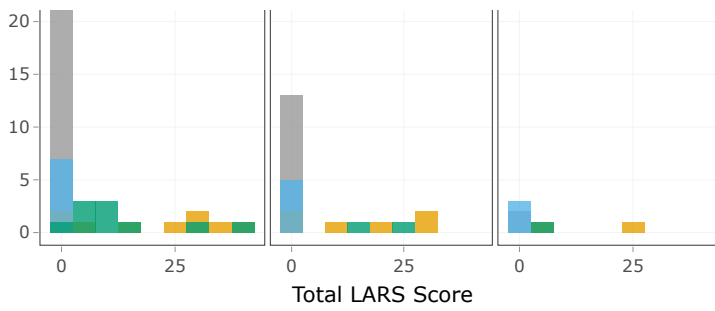
The following plot presents EORTC CR29 score distribution, faceted by age group:



### 4.7.2 LARS Score Distribution by Age Group

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

The following plot presents LARS score distribution, faceted by age group:

Total LARS Score

## 4.8 Correlation

### 4.8.1 EORTC CR29 Correlation Plot

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

Please note the white 'blocks' are a consequence of the questionnaire offering two separate sets of questions to individuals based on whether they have a stoma, and based on their gender. No respondents answer both sets of questions.

Correlation does not equal causality, and correlation is not necessarily indicative of causality. No causality should be assumed between groups with strong correlation based based on this plot.

## 4.8.2 LARS Correlation Plot

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

Correlation does not equal causality, and correlation is not necessarily indicative of causality. No causality should be assumed between groups with strong correlation based based on this plot.
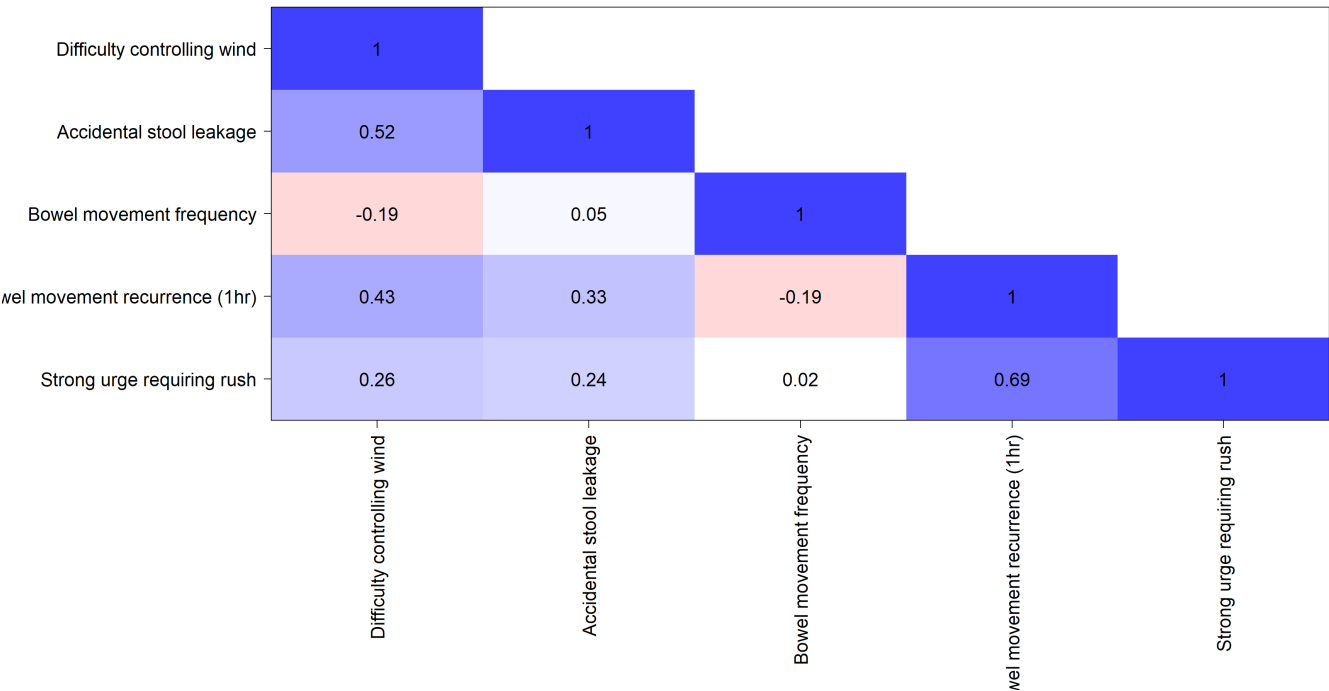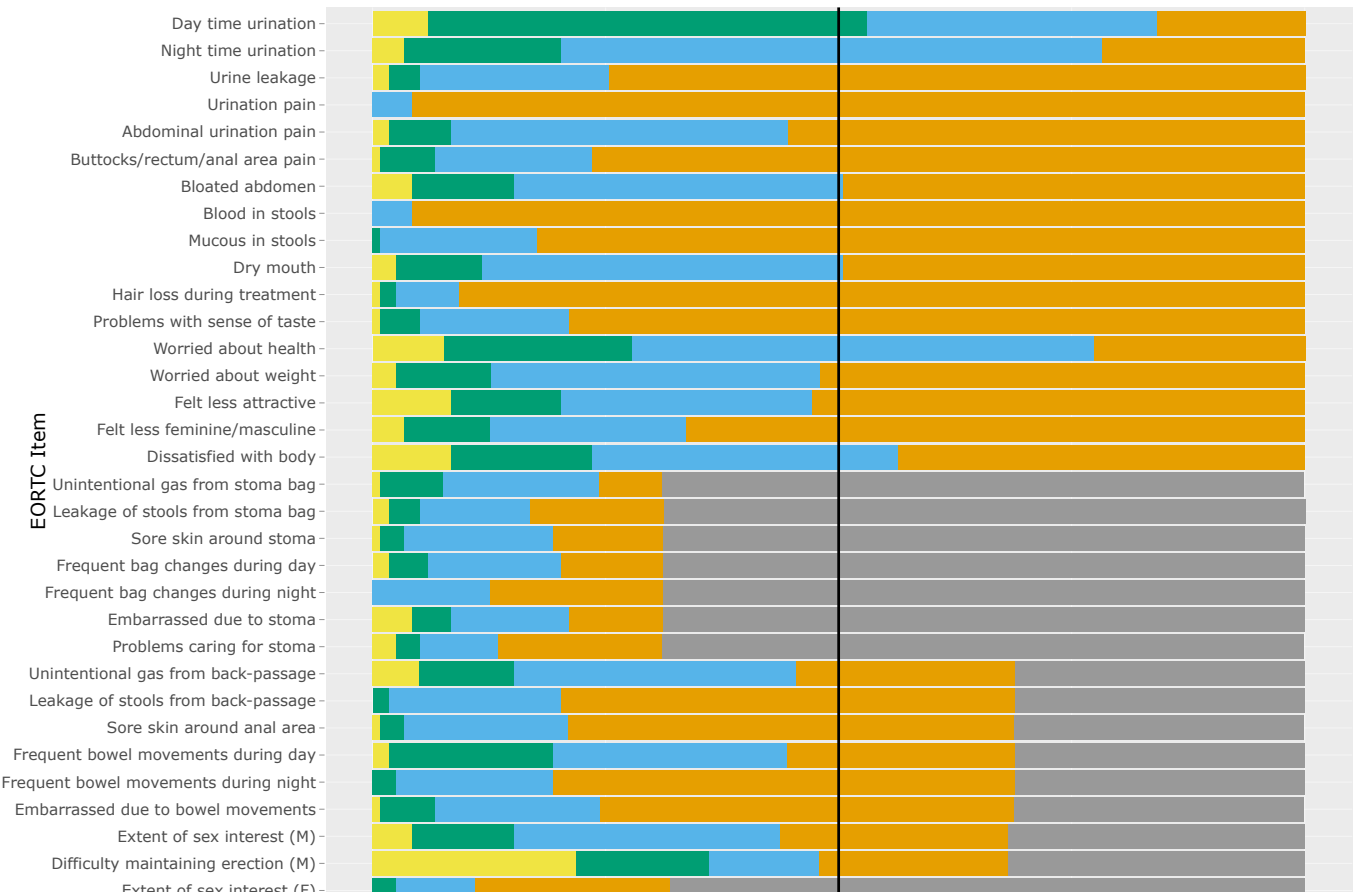


## 4.9 Individual Responses

### 4.9.1 EORTC CR29 Individual Responses

Based on 119 of 124 records. This visualisation excludes five records that have been omitted due to data linkage issues.

The visualisations below present all responses to all questions relating to EORTC CR29:

Response Option ▪ Question Not Applicable ▪ Not at All ▪ A little ▪ Quite a Bit ▪ Very Much

### 4.9.2 LARS Individual Responses

Further work is required to develop these plots due to the nature of LARS responses; specifically, the reponses and their respective scores vary based on the question.

# 5 Author Notes

## 5.1 Known Bugs and Issues

Some visual elements relating to faceted LARS scores present accurately, but their respective tool tips present 'NA' in place of the number that is actually being rendered on the plot.

Individual response plots for EORTC CR29 are available, but not LARS at this time. The scoring system used in LARS presents a challenge as the same response has different scores for separate questions.

Due the high number of questions in the EORTC CR29, some of the plots are very large and present huge amounts of information. Perhaps splitting or otherwise finding a solution could be explored in future.

The size of the data set is currently quite small; many plots will look considerably better when more data is available.

Some tables do not have total fields (for rows and columns).

Unclear if MSOA needs to be defined - the visual immediately following it could clarify.

Some plot tooltips have unrefined names, such as 'PatientClass'. This should be corrected to best represent the data.

Invidiual response plot tooltips have buggy names, incorporating the factor data class; this detracts from the visual and should be corrected.

## 5.2 Future Developments

- Incorporate the Welsh index of Multiple Deprivation into report; relatively simple once geographic elements added.
- Radar plots for scores
- County-based plots (not done here due to potential reliability issues)
- Explore more robust data linkage
- Split or otherwise 'tidy' the large plots that do not present optimally
- Implement solution for 'total' fields on tables that need them

# MSK Physiotherapy PROMs Report

Data.ScienceHDD@Wales.nhs.uk (mailto:Data.ScienceHDD@Wales.nhs.uk)

10/02/2023

# 1 INTRODUCTION

This document provides visualisations and examples of statistical analysis on a dataset of 4,293 records (4,293 distinct patients) from the MSK Physiotherapy Patient Reported Outcome Measures (PROMs) data for the period 23 June 2022 to 15 November 2022, with dates being taken from PROMs forms' completion dates. The data analysed was derived from one dataset.

The purpose of this report is to contextualise the demographic of patients in a concise and aesthetic manner, while also providing insight regarding the cohort of patients and their reported outcomes.

All assumptions and transformative manipulations made to data will be presented transparently throughout this report, adjacent to the respective visualisations that are affected by these assumptions/transformations.

Please also note that all plots in this report are interactive.

# 2 CAVEATS AND CONSTRAINTS

MSK PROMs dataset consisted of a total of 7,442 records (4,293 distinct patients). Of the 4,293 distinct patients who submitted responses, 1894 of these patients submitted multiple responses. Adjustment has been made in reporting PROMs for patients with multiple form submissions, where the most recent submission is chosen and prior submissions are ignored.

Please note that all 4,293 valid records have been used for PROMs analysis throughout the entirety of this report.

Patient demographic statistics have been analysed using distinct patient numbers, meaning that statistics have been calculated using the data from the 4,293 distinct patients who submitted form responses.

Most tables included in this report have the ability to be transferred to another application for ease of reference. Where enabled, this is undertaken by using the buttons at the top of each table:

- Copy - enables the table to be copied to the system clipboard for pasting in another application;
- CSV - exports a copy of the table in CSV (Comma Separated Value) format;
- Excel - exports a copy of the table in Excel format;
- PDF - exports a copy of the table in PDF (Portable Document Format) format;
- Print - prints a copy of the table.

# 3 SUMMARY

## 3.1 Patient Demographics

| Characteristic | Neck, N = 176[1] | Shoulder, N = 719[1] | Elbow, N = 72[1] | Wrist/hand, N = 277[1] | Mid back, N = 70[1] | Lower back, N = 658[1] | Hip, N = 356[1] | Knee, N = 756[1] | Ankle/foot, N = 331[1] | Multiple site, N = 869[1] | N/A, N = 9[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Gender** | | | | | | | | | | | |
| Female | 112 (64%) | 425 (59%) | 39 (54%) | 182 (66%) | 42 (60%) | 415 (63%) | 237 (67%) | 424 (56%) | 191 (58%) | 593 (68%) | 6 (67%) |
| Male | 64 (36%) | 294 (41%) | 33 (46%) | 95 (34%) | 28 (40%) | 243 (37%) | 119 (33%) | 332 (44%) | 140 (42%) | 276 (32%) | 3 (33%) |
| **Age (years)** | 57.5 (13.6) | 55.7 (14.9) | 50.6 (13.8) | 54.3 (15.6) | 51.4 (19.2) | 51.3 (16.5) | 57.5 (15.6) | 52.4 (16.9) | 49.0 (15.8) | 52.8 (15.9) | 52.6 (16.2) |
| **Age Group** | | | | | | | | | | | |
| 18-24 | 3 (1.7%) | 26 (3.6%) | 3 (4.2%) | 10 (3.6%) | 6 (8.6%) | 32 (4.9%) | 9 (2.5%) | 53 (7.0%) | 26 (7.9%) | 37 (4.3%) | 0 (0%) |
| 25-34 | 11 (6.2%) | 51 (7.1%) | 8 (11%) | 32 (12%) | 14 (20%) | 87 (13%) | 27 (7.6%) | 89 (12%) | 49 (15%) | 114 (13%) | 2 (22%) |
| 35-44 | 15 (8.5%) | 72 (10%) | 11 (15%) | 30 (11%) | 6 (8.6%) | 132 (20%) | 38 (11%) | 101 (13%) | 49 (15%) | 117 (13%) | 2 (22%) |
| 45-54 | 36 (20%) | 152 (21%) | 21 (29%) | 51 (18%) | 11 (16%) | 124 (19%) | 62 (17%) | 127 (17%) | 75 (23%) | 153 (18%) | 0 (0%) |
| 55-64 | 53 (30%) | 204 (28%) | 19 (26%) | 78 (28%) | 11 (16%) | 121 (18%) | 89 (25%) | 196 (26%) | 73 (22%) | 225 (26%) | 2 (22%) |
| 65-74 | 42 (24%) | 159 (22%) | 7 (9.7%) | 55 (20%) | 13 (19%) | 103 (16%) | 82 (23%) | 131 (17%) | 48 (15%) | 155 (18%) | 2 (22%) |
| 75-84 | 15 (8.5%) | 46 (6.4%) | 3 (4.2%) | 20 (7.2%) | 9 (13%) | 56 (8.5%) | 45 (13%) | 52 (6.9%) | 10 (3.0%) | 64 (7.4%) | 1 (11%) |
| 85+ | 1 (0.6%) | 9 (1.3%) | 0 (0%) | 1 (0.4%) | 0 (0%) | 3 (0.5%) | 4 (1.1%) | 7 (0.9%) | 1 (0.3%) | 4 (0.5%) | 0 (0%) |

[1] n (%); Mean (SD)

## 3.2 Patient Residence by Local Authority

Patient residence location is based on linkage to recent Healthcare Professional (HCP) referral records.



Legend:
- 0
- 200
- 400
- 600
- 800
- 1,000
- 1,200
- 1,400
- 1,600
- 1,800

Leaflet (https://leafletjs.com)

## 3.3 Patient Residence by Middle Layer Super Output Area

Patient residence location is based on linkage to recent Healthcare Professional (HCP) referral records.



Legend:
- 0
- 20
- 40
- 60
- 80
- 100
- 120
- 140

Leaflet (https://leafletjs.com)

## 3.4 Patient Residence County and Treatment County Flow

Patient residence location is based on linkage to recent Healthcare Professional (HCP) referral records.

16/25
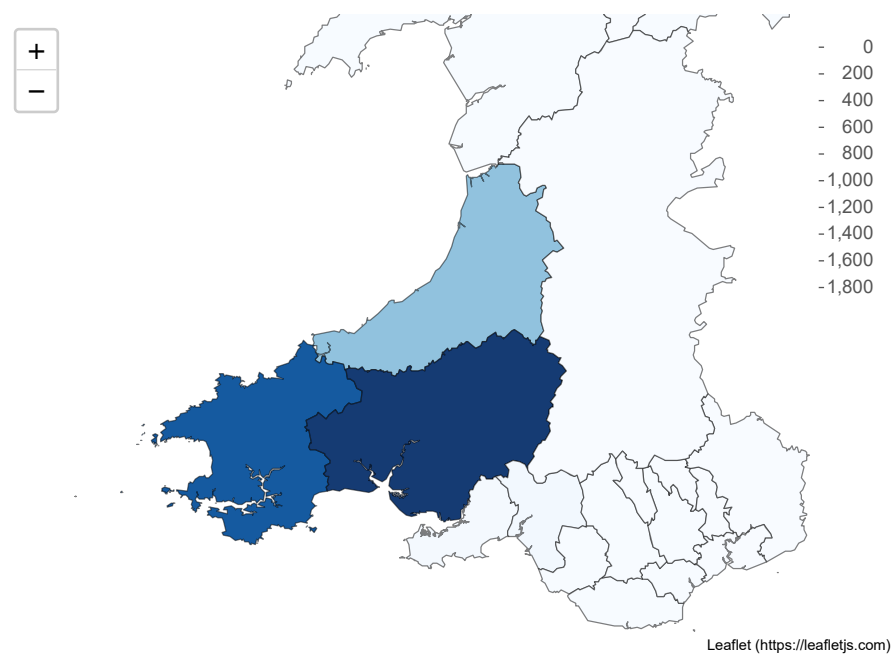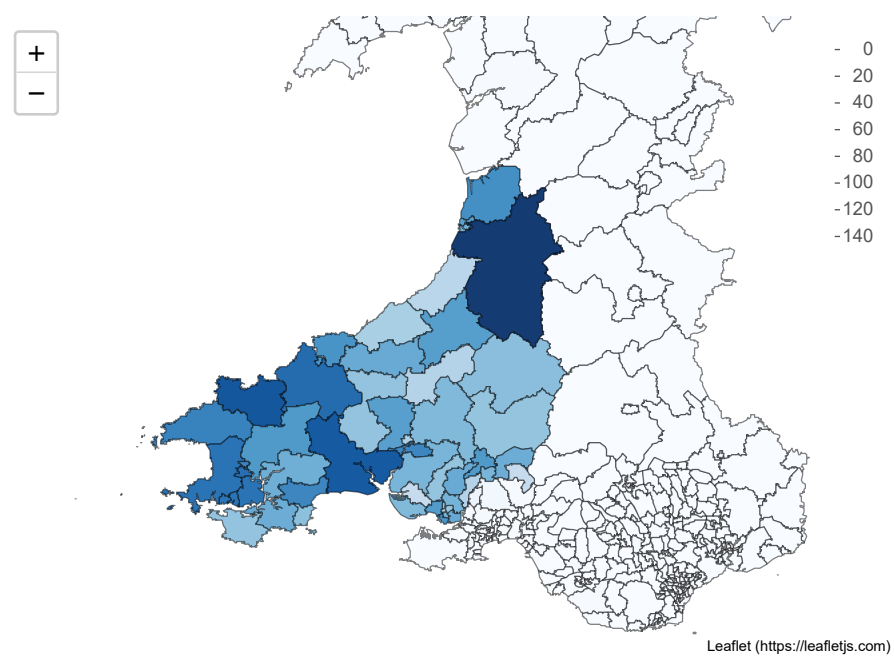
Residence County — Treatment County
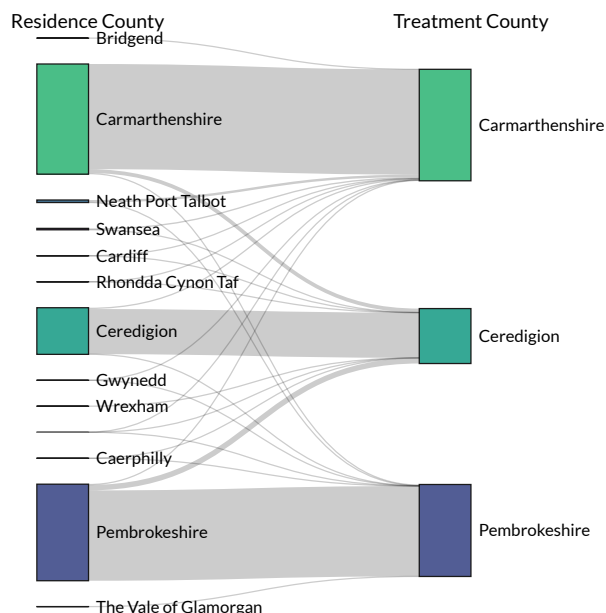
## 3.5 Responses by Gender

Of the 4,293 records analysed in this report, 1627 records (37.9%) were attributed to male patients while 2666 records (62.1%) were attributed to female patients.

The following table provides the count of records by gender and body part. Please note that when asked which body part is most affected by the condition, 9 patients (N/A) did not choose a response.
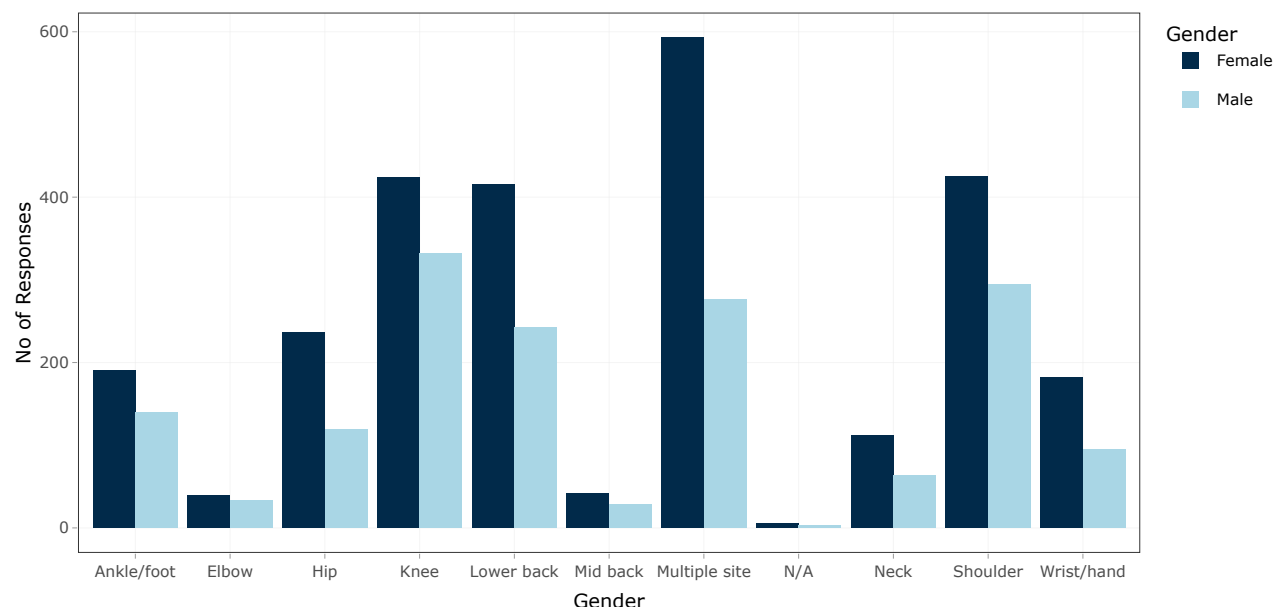
Copy  CSV  Excel  PDF  Print

| Gender | Ankle/foot | Elbow | Hip | Knee | Lower back | Mid back | Multiple site | N/A | Neck | Shoulder | Wrist/hand | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 191 | 39 | 237 | 424 | 415 | 42 | 593 | 6 | 112 | 425 | 182 | 2,666 |
| Male | 140 | 33 | 119 | 332 | 243 | 28 | 276 | 3 | 64 | 294 | 95 | 1,627 |
| Total | 331 | 72 | 356 | 756 | 658 | 70 | 869 | 9 | 176 | 719 | 277 | 4,293 |

A visual representation of the above table can be found below:



## 3.6 Responses by Age

The below table provides a breakdown of the 4,293 records analysed in this report by age group banding:

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| Age Group | Record Count | Percent of Total |
|---|---|---|
| 18-24 | 205 | 4.8% |
| 25-34 | 484 | 11.3% |
| 35-44 | 573 | 13.3% |
| 45-54 | 812 | 18.9% |
| 55-64 | 1,071 | 24.9% |
| 65-74 | 797 | 18.6% |
| 75-84 | 321 | 7.5% |
| 85+ | 30 | 0.7% |
| Total | 4,293 | 100% |

The following table provides total record count by age group banding and body part:

Copy  CSV  Excel  PDF  Print

| Age Group | Ankle/foot | Elbow | Hip | Knee | Lower back | Mid back | Multiple site | Neck | Shoulder | Wrist/hand | N/A | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-24 | 26 | 3 | 9 | 53 | 32 | 6 | 37 | 3 | 26 | 10 | | 205 |
| 25-34 | 49 | 8 | 27 | 89 | 87 | 14 | 114 | 11 | 51 | 32 | 2 | 484 |
| 35-44 | 49 | 11 | 38 | 101 | 132 | 6 | 117 | 15 | 72 | 30 | 2 | 573 |
| 45-54 | 75 | 21 | 62 | 127 | 124 | 11 | 153 | 36 | 152 | 51 | | 812 |
| 55-64 | 73 | 19 | 89 | 196 | 121 | 11 | 225 | 53 | 204 | 78 | 2 | 1,071 |
| 65-74 | 48 | 7 | 82 | 131 | 103 | 13 | 155 | 42 | 159 | 55 | 2 | 797 |
| 75-84 | 10 | 3 | 45 | 52 | 56 | 9 | 64 | 15 | 46 | 20 | 1 | 321 |
| 85+ | 1 | | 4 | 7 | 3 | | 4 | 1 | 9 | 1 | | 30 |
| Total | 331 | 72 | 356 | 756 | 658 | 70 | 869 | 176 | 719 | 277 | 9 | 4,293 |

The age distribution of the 4,293 distinct patients whose submissions were analysed in this report is provided, by body part, in the below histogram:
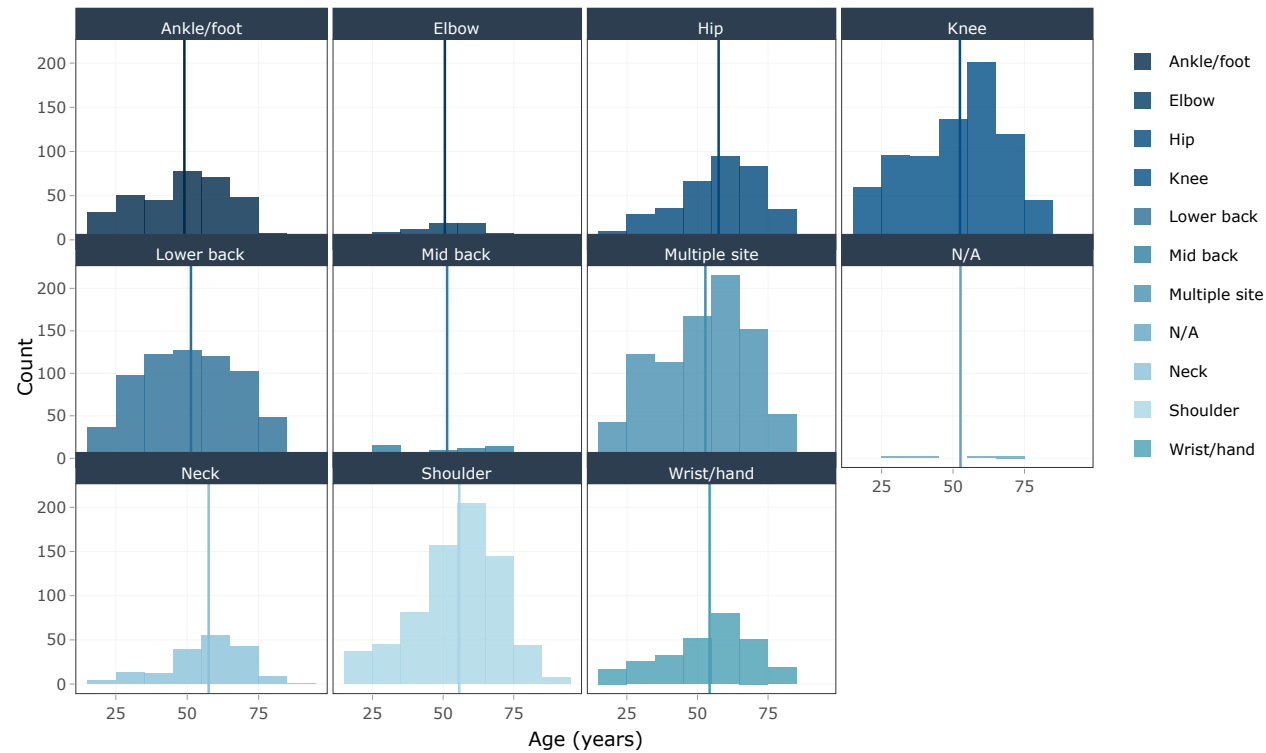
# 4 PROM ANALYSIS

Data has been collected with regards to one MSK Physiotherapy Patient Reported Outcome Measures.

This section seeks to present the scoring in a number of ways; the objective of which is to provide insight and understanding of the data collected and what it means for Hywel Dda patients.

## 4.1 Musculoskeletal Health Questionnaire (MSK-HQ)

The MSK-HQ is a short questionnaire that allows people with musculoskeletal conditions such as joint, back, neck, bone, and muscle symptoms such as aches, pains, and/or stiffness to report their symptoms and quality of life. Respondents were requested to provide responses to fifteen questions examining their symptom impact during the past two weeks, and each respondent's responses were used to calculate an overall MSK-HQ score. The overall MSK-HQ is scored on a range of 0-56, with a higher score indicating better MSK-HQ health status.

## 4.2 Abbreviated Element

### 4.2.1 MSK-HQ Abbreviations

The questions asked have been set out in full below, alongside the abbreviation used to reference each question throughout this section of the report:

[Copy] [CSV] [Excel] [PDF] [Print]

| Original Item | Abbreviation |
| --- | --- |
| How severe was your usual joint or muscle pain and/or stiffness overall during the day in the last 2 weeks? | Day Pain / Stiffness |
| How severe was your usual joint or muscle pain and/or stiffness overall during the night in the last 2 weeks? | Night Pain / Stiffness |
| How much have your symptoms interfered with your ability to walk in the last 2 weeks? | Walking |
| How much have your symptoms interfered with your ability to wash or dress yourself in the last 2 weeks? | Washing & Dressing |
| How much has it been a problem for you to do physical activities (e.g. going for a walk or jogging) to the level you want because of your joint or muscle symptoms in the last 2 weeks? | Physical Activities |
| How much have your joint or muscle symptoms interfered with your work or daily routine in the last 2 weeks (including work & jobs around the house)? | Work / Daily Routine |
| How much have your joint or muscle symptoms interfered with your social activities and hobbies in the last 2 weeks? | Social Activities / Hobbies |
| How often have you needed help from others (including family, friends or carers) because of your joint or muscle symptoms in the last 2 weeks? | Needing Help |
| How often have you had trouble with either falling asleep or staying asleep because of your joint or muscle symptoms in the last 2 weeks? | Sleep |
| How much fatigue or low energy have you felt in the last 2 weeks? | Fatigue |
| How much have you felt anxious or low in your mood because of your joint or muscle symptoms in the last 2 weeks? | Emotional Wellbeing |
| Thinking about your joint or muscle symptoms, how well do you feel you understand your condition and any current treatment (including your diagnosis and medication)? | Condition & Treatment Understanding |
| How confident have you felt in being able to manage your joint or muscle symptoms by yourself in the last 2 weeks (e.g. medication, changing lifestyle)? | Symptom Management Confidence |
| How much have your joint or muscle symptoms bothered you overall in the last 2 weeks? | Overall Impact |
| In the past week, on how many days have you done a total of 30 minutes or more of physical activity, which was enough to raise your heart rate? This may include sport, exercise and brisk walking or cycling for recreation or to get to and from places, but should not include housework or physical activity that is part of your job. | Physical Activity Levels |

## 4.3 Score Total Distributions

### 4.3.1 Total MSK-HQ Score

14 of the MSK-HQ questions asked respondents to select one of five responses that best described the impact of their symptoms during the past two weeks, with each response assigned a score between **0 - describing highest impact** to **4 - describing lowest impact**.

The total of a respondent's scores give the overall result of their MSK-HQ. The MSK-HQ is scored on a range of 0-56, with a higher score indicating better MSK-HQ health status.
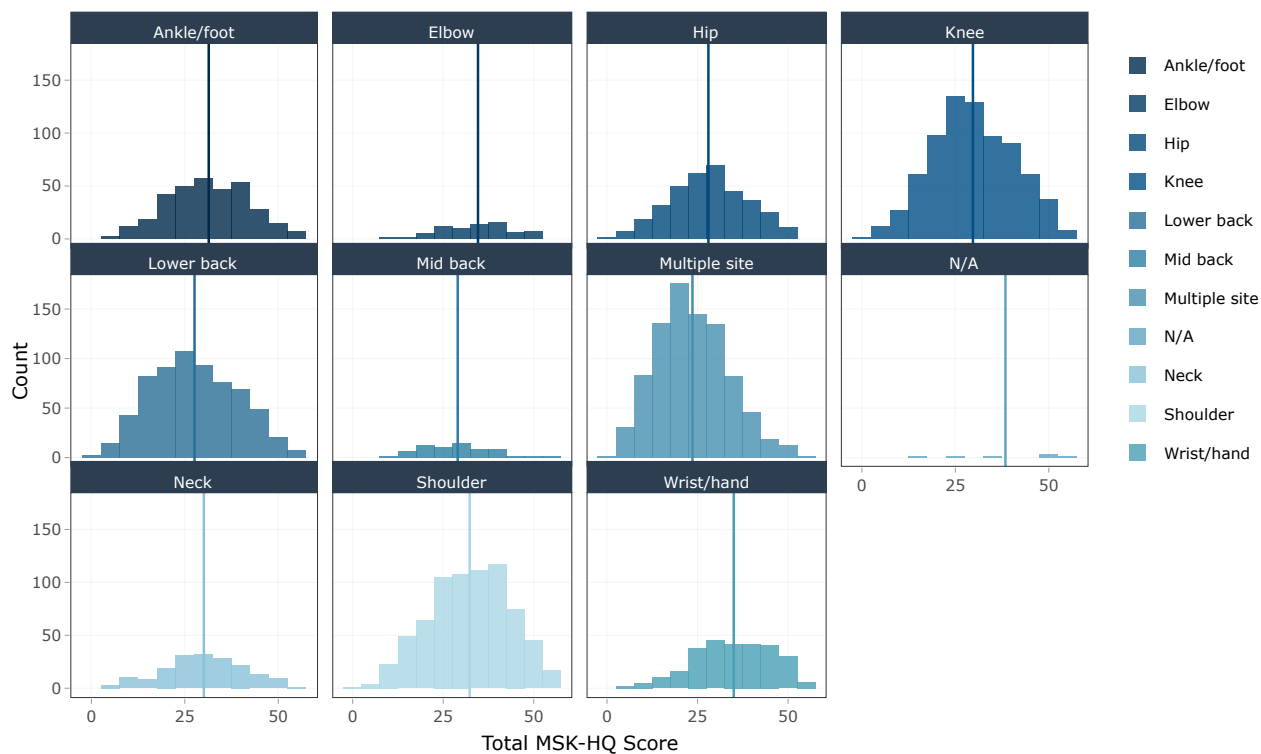
The distribution of total MSK-HQ scores for all respondents analysed, independent of body part, gender, or age, is outlined in the histogram below, with the mean score indicated by the vertical line.
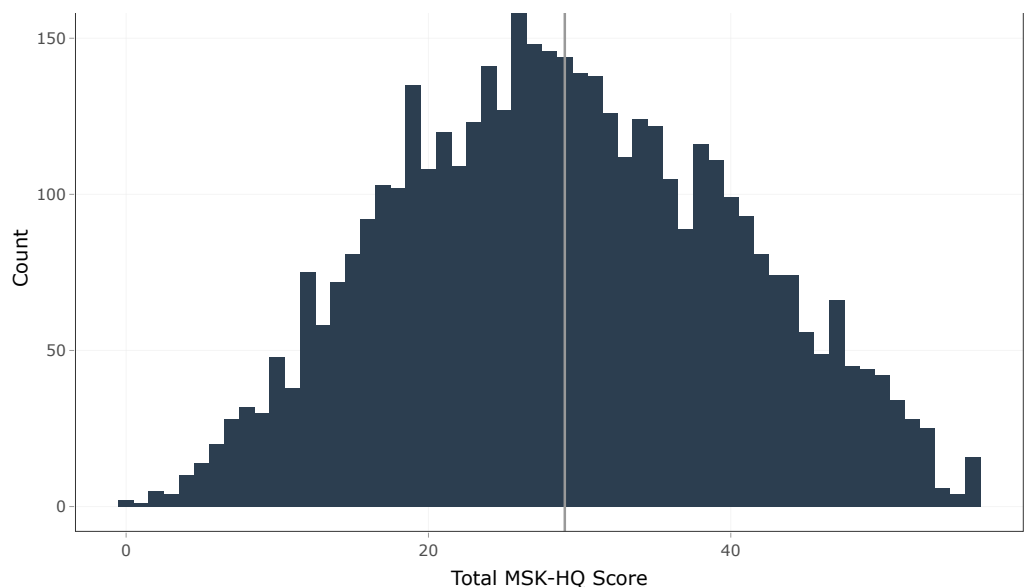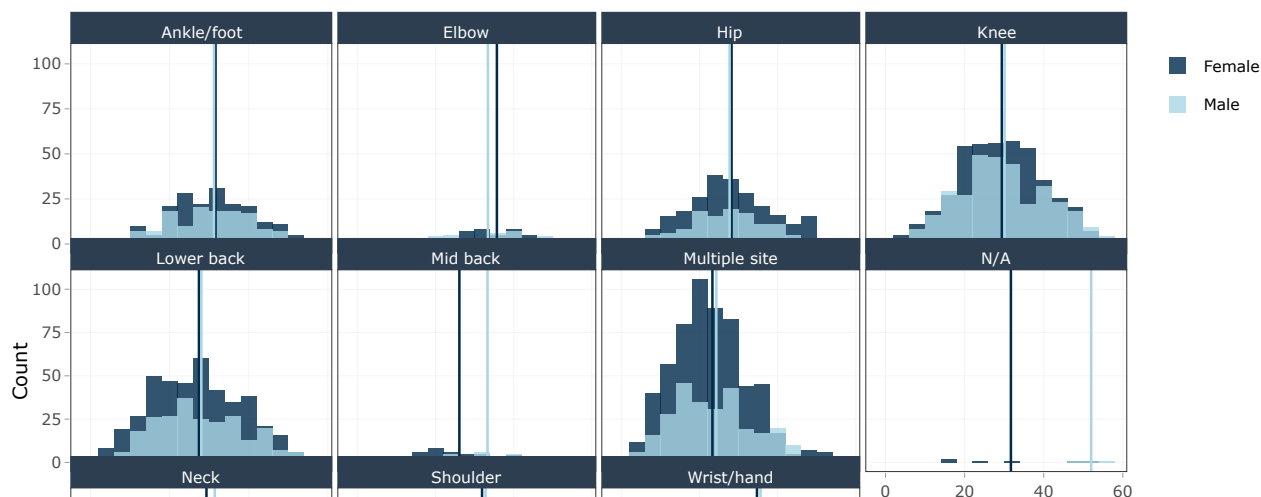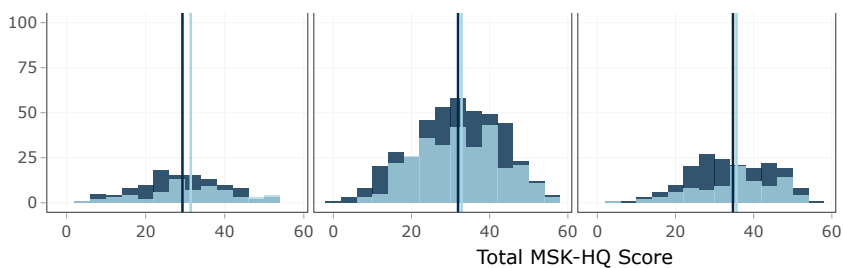
### 4.3.2 Responses by Body Part

The distribution of total MSK-HQ scores for body part is outlined in the histogram below, with the mean scores indicated by the vertical lines:
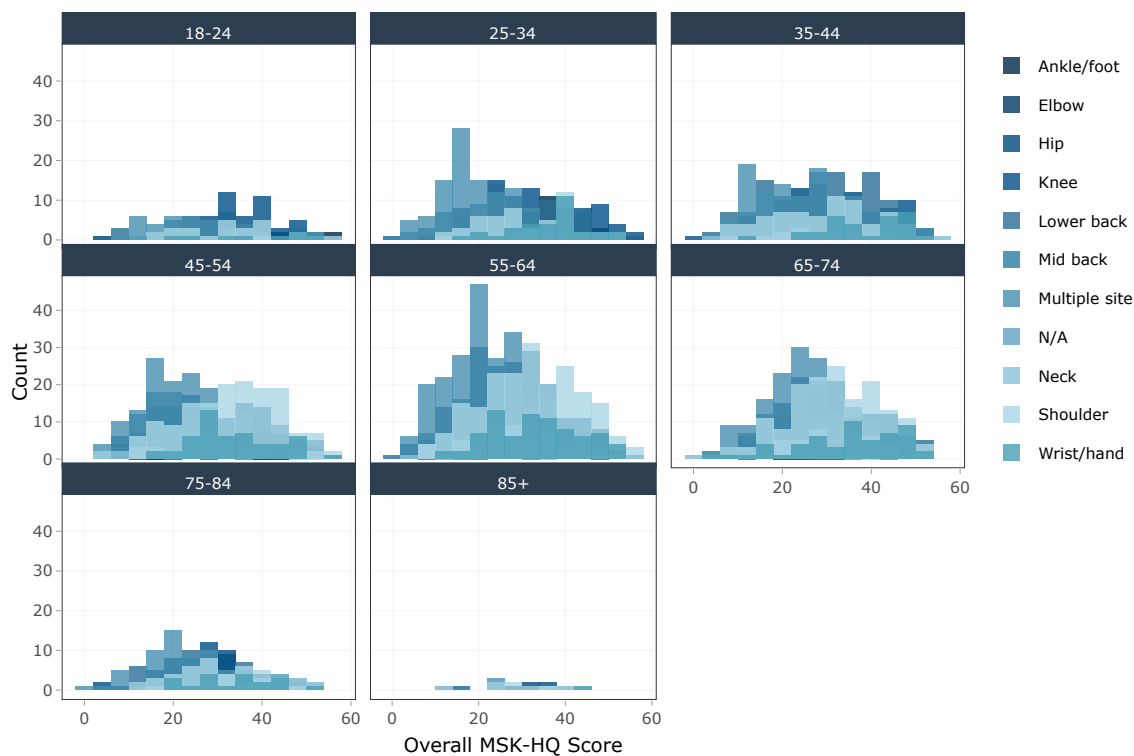


### 4.3.3 Responses by Gender

The distribution of total MSK-HQ scores by gender and body part is outlined in the histogram below, with the mean scores indicated by the vertical lines:

### 4.3.4 Responses by Age Group

The distribution of total MSK-HQ scores by age group and body part is outlined in the histogram below:



### 4.3.5 Responses by Activity Level

Respondents were asked to state their activity levels in the previous week with the following results:

- None = 1663 records (38.74%)
- 1 day = 384 records (8.94%)
- 2 days = 600 records (13.98%)
- 3 days = 548 records (12.76%)
- 4 days = 315 records (7.34%)
- 5 days = 290 records (6.76%)
- 6 days = 91 records (2.12%)
- 7 days = 402 records (9.36%)

The distribution of total MSK-HQ scores for all respondents by Activity Level is outlined in the histogram below, with mean score indicated by the vertical line:
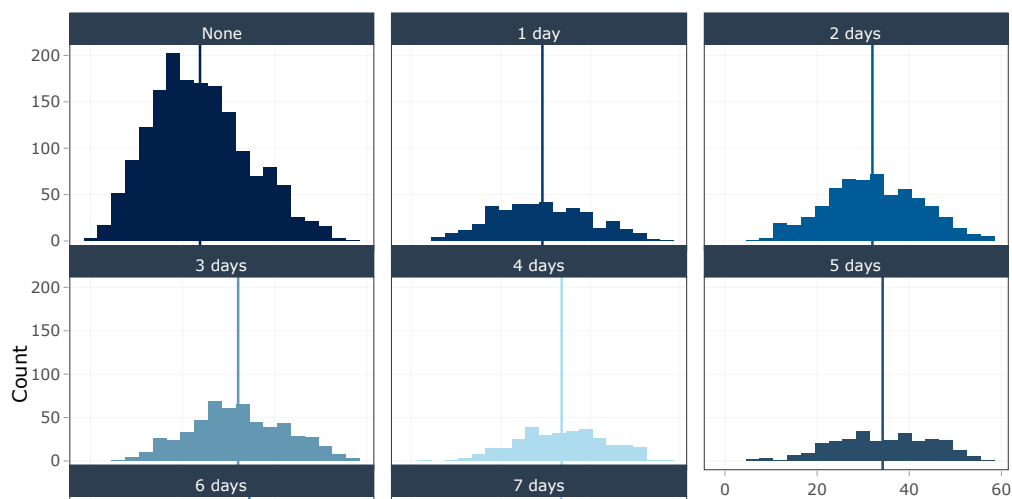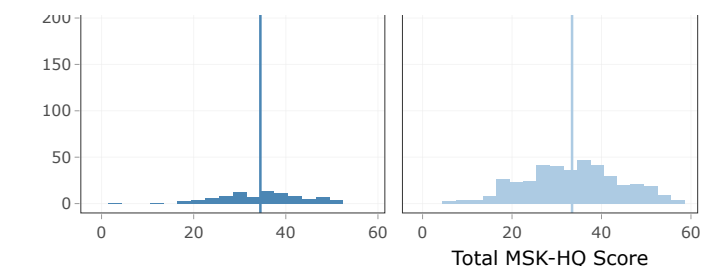
## 4.4 Individual MSK-HQ Scores

Across the 14 questions contributing to MSK-HQ score calculation, respondents had ten distinct sets of responses to choose from. This means that it is not possible to do a direct comparison of responses when using the specific question:response-set combinations. However, to facilitate comparison of responses across the 14 questions contributing to total MSK-HQ score calculation, we can apply the following broad response set to each of these questions:

Copy | Excel | CSV | PDF | Print

| Score | Broad Response | Broad Response Detail |
|-------|----------------|------------------------|
| 0 | Extreme | Extreme negative impact or constant occurrence |
| 1 | Severe | Severe negative impact or frequent occurrence |
| 2 | Moderate | Moderate negative impact or occasional occurrence |
| 3 | Slight | Slight negative impact or rare occurrence |
| 4 | None | No negative impact or occurrence |

## 4.5 Response Correlations

### 4.5.1 MSK-HQ Correlation Plot

The following plot is intended to indicate whether there are any correlations between scores provided for individual MSK-HQ responses within the records analysed independent of body part, gender, or age. Potential response-response correlations are presented using colour coding and p-value labelling where a darker colour (and, therefore, higher p-value), signifies a stronger correlation between responses. **Correlation does not equal causality, and correlation is not necessarily indicative of causality. No causality should be assumed between groups with strong correlation based based on this plot.**
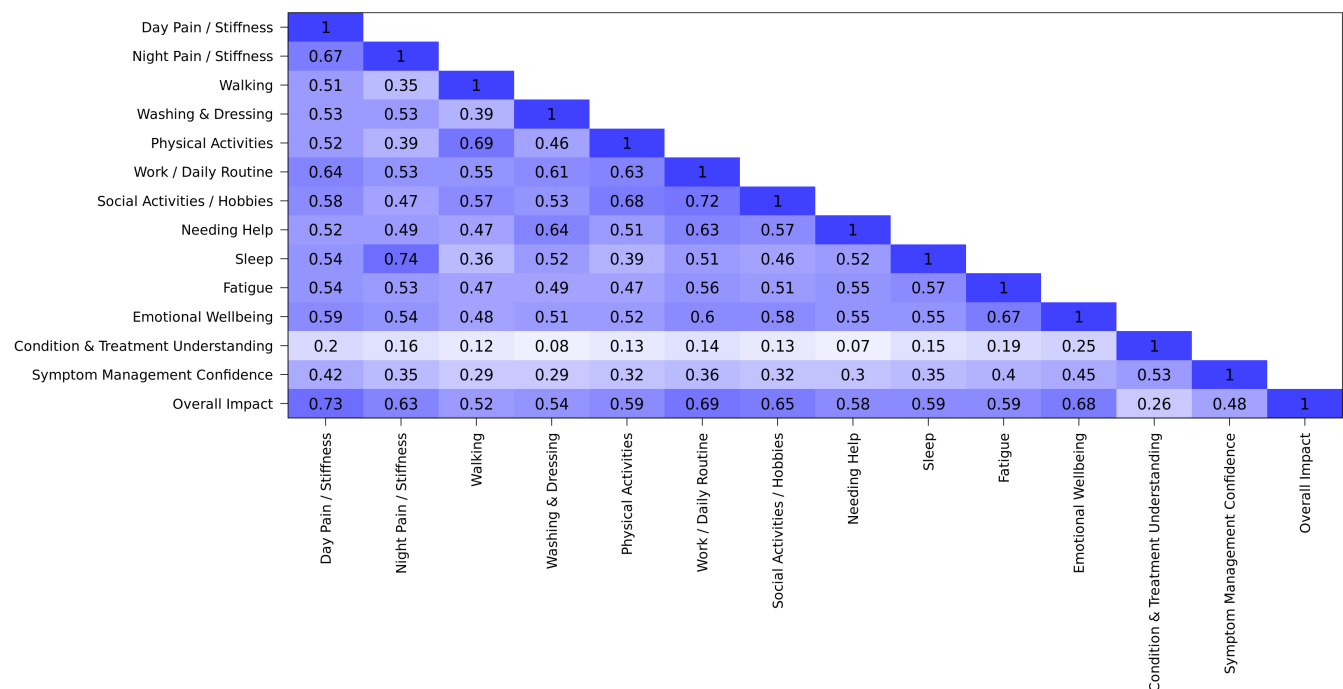


## 4.6 Individual Responses

### 4.6.1 MSK-HQ Individual Response Distribution

The below bar charts outline the proportion of responses for each of the 14 items in the MSK-HQ questionnaire independent of body part, gender, or age:
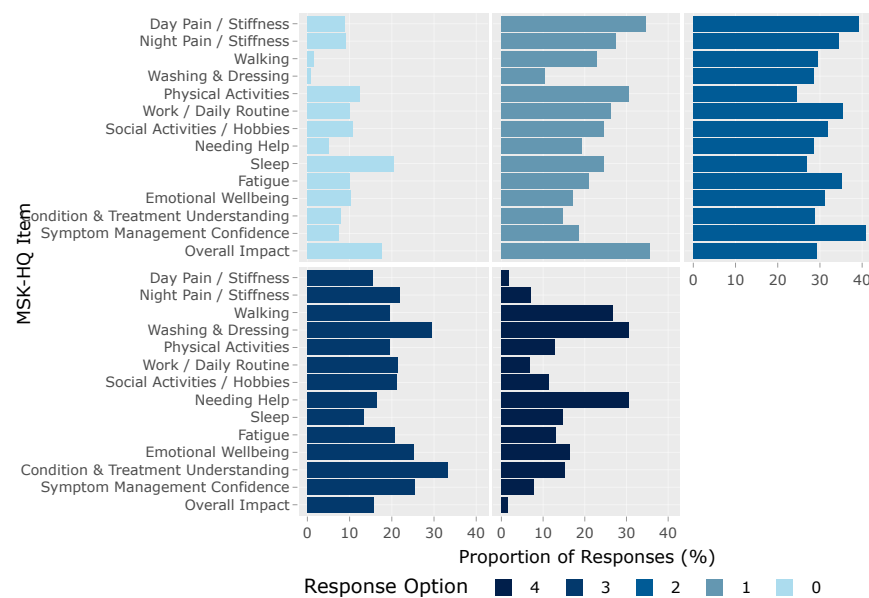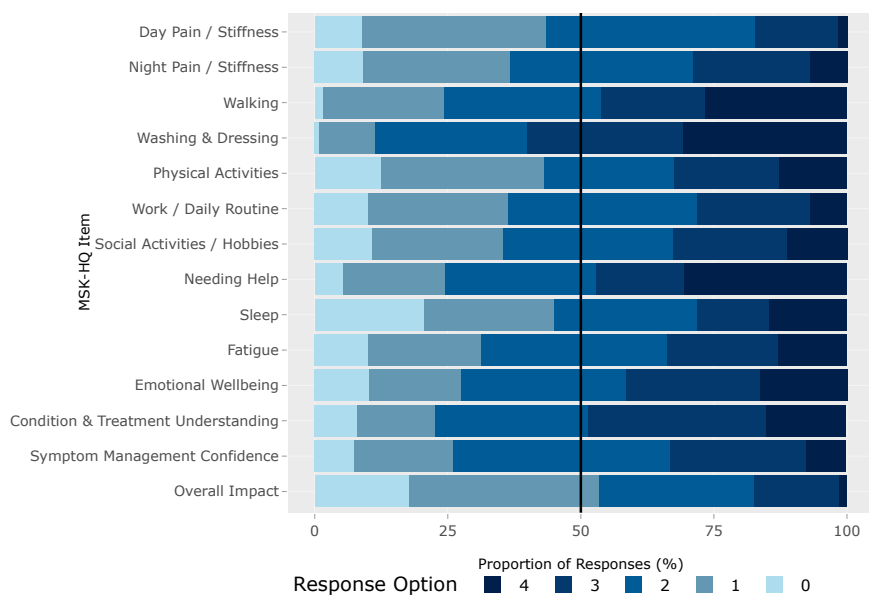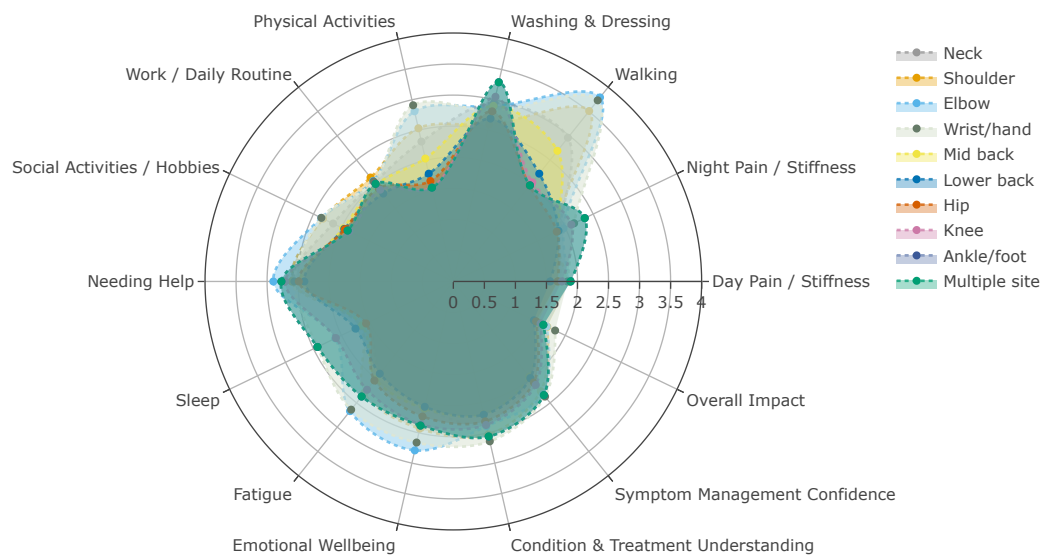
## 4.6.2 Average Individual Response Scores By Body Part

The table and visualisations below demonstrate the average score (between **0 to 4**) for each of the 14 MSK-HQ items, as well as the average total MSK-HQ score (ranging from 0-59), examined against body part, independent of gender or age.

| MSK-HQ Item | Ankle/foot, N = 331[1] | Elbow, N = 72[1] | Hip, N = 356[1] | Knee, N = 756[1] | Lower back, N = 658[1] | Mid back, N = 70[1] | Multiple site, N = 869[1] | N/A, N = 9[1] | Neck, N = 176[1] | Shoulder, N = 719[1] | Wrist/hand, N = 277[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Day Pain / Stiffness** | 1.89 (0.93) | 1.88 (0.77) | 1.68 (0.91) | 1.75 (0.89) | 1.56 (0.91) | 1.69 (0.81) | 1.35 (0.83) | 2.33 (1.66) | 1.73 (0.79) | 1.87 (0.90) | 1.84 (0.92) |
| **Night Pain / Stiffness** | 2.35 (1.11) | 1.97 (0.87) | 1.85 (1.02) | 2.11 (1.08) | 1.88 (1.04) | 1.87 (0.98) | 1.56 (1.00) | 2.78 (1.48) | 1.91 (0.94) | 1.84 (1.05) | 2.16 (1.06) |
| **Walking** | 1.98 (0.98) | 3.79 (0.60) | 1.97 (0.89) | 2.04 (0.93) | 2.22 (1.04) | 2.69 (0.97) | 1.95 (1.00) | 3.11 (1.17) | 2.96 (1.04) | 3.51 (0.82) | 3.73 (0.66) |
| **Washing & Dressing** | 3.29 (0.88) | 2.89 (0.94) | 2.81 (0.99) | 3.05 (0.97) | 2.69 (1.03) | 2.90 (0.93) | 2.53 (1.04) | 3.33 (1.12) | 2.95 (1.02) | 2.59 (0.96) | 2.82 (1.01) |
| **Physical Activities** | 1.55 (1.14) | 2.81 (1.07) | 1.66 (1.03) | 1.55 (1.04) | 1.78 (1.18) | 2.03 (1.08) | 1.49 (1.06) | 2.89 (1.54) | 2.31 (1.22) | 2.53 (1.25) | 2.91 (1.18) |
| **Work / Daily Routine** | 2.01 (1.16) | 2.07 (1.09) | 1.92 (1.01) | 1.89 (1.08) | 1.81 (1.08) | 1.99 (1.03) | 1.56 (0.96) | 2.44 (1.51) | 2.04 (1.05) | 2.14 (1.03) | 2.06 (1.09) |
| **Social Activities / Hobbies** | 1.89 (1.18) | 2.36 (1.13) | 1.94 (1.09) | 1.86 (1.13) | 1.95 (1.14) | 1.97 (1.17) | 1.69 (1.08) | 2.89 (1.45) | 2.15 (1.14) | 2.33 (1.20) | 2.36 (1.17) |
| **Needing Help** | 2.77 (1.24) | 2.90 (1.05) | 2.49 (1.27) | 2.71 (1.23) | 2.40 (1.24) | 2.46 (1.21) | 2.04 (1.23) | 3.00 (1.50) | 2.60 (1.31) | 2.60 (1.20) | 2.56 (1.16) |
| **Sleep** | 2.43 (1.32) | 2.11 (1.12) | 1.56 (1.25) | 2.10 (1.30) | 1.75 (1.30) | 1.63 (1.28) | 1.27 (1.16) | 2.78 (1.86) | 1.55 (1.23) | 1.66 (1.27) | 2.43 (1.33) |
| **Fatigue** | 2.37 (1.20) | 2.67 (1.16) | 2.04 (1.06) | 2.23 (1.10) | 1.90 (1.09) | 2.01 (1.00) | 1.51 (1.08) | 2.89 (1.27) | 1.88 (1.10) | 2.30 (1.14) | 2.64 (1.13) |

[1] Mean (SD)

| MSK-HQ Item | Ankle/foot, N = 331[1] | Elbow, N = 72[1] | Hip, N = 356[1] | Knee, N = 756[1] | Lower back, N = 658[1] | Mid back, N = 70[1] | Multiple site, N = 869[1] | N/A, N = 9[1] | Neck, N = 176[1] | Shoulder, N = 719[1] | Wrist/hand, N = 277[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Emotional Wellbeing | 2.38 (1.17) | 2.79 (1.02) | 2.23 (1.20) | 2.36 (1.18) | 2.07 (1.21) | 2.10 (1.02) | 1.75 (1.10) | 3.11 (1.05) | 2.08 (1.14) | 2.43 (1.21) | 2.66 (1.18) |
| Condition & Treatment Understanding | 2.56 (1.12) | 2.39 (1.22) | 2.31 (1.11) | 2.37 (1.15) | 2.20 (1.09) | 2.19 (1.22) | 2.06 (1.12) | 2.44 (1.51) | 2.35 (1.06) | 2.53 (1.14) | 2.64 (1.11) |
| Symptom Management Confidence | 2.34 (1.04) | 2.32 (0.95) | 2.08 (0.99) | 2.13 (1.02) | 1.99 (1.02) | 1.96 (1.01) | 1.76 (0.94) | 2.00 (1.50) | 1.99 (0.94) | 2.26 (1.00) | 2.37 (1.09) |
| Overall Impact | 1.61 (1.00) | 1.67 (0.95) | 1.48 (0.95) | 1.56 (1.01) | 1.44 (0.98) | 1.51 (0.97) | 1.07 (0.89) | 2.44 (1.59) | 1.57 (0.97) | 1.68 (1.03) | 1.82 (1.04) |
| Total MSK-HQ Score | 31.42 (10.74) | 34.61 (9.03) | 28.02 (10.53) | 29.70 (10.92) | 27.63 (11.45) | 28.99 (9.99) | 23.58 (9.91) | 38.44 (15.97) | 30.06 (10.88) | 32.27 (10.93) | 34.99 (10.47) |

[1] Mean (SD)


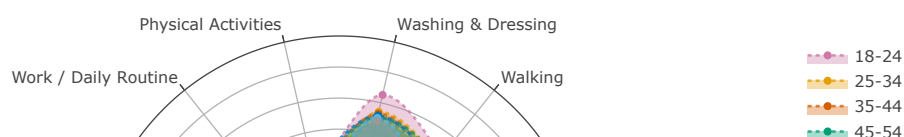
### 4.6.3 Average Individual Response Scores By Gender

The visualisation below demonstrate the average score (between 0 to 4) for each of the 14 MSK-HQ items examined against against whether the respondent reported being male or female.

Due to the low average individual scores and the small distinction between groups and MSK-HQ items, the scale of the visualisation has been reduced (from the maximum potential average of 4 down to 3) to enable interpretation of the data.
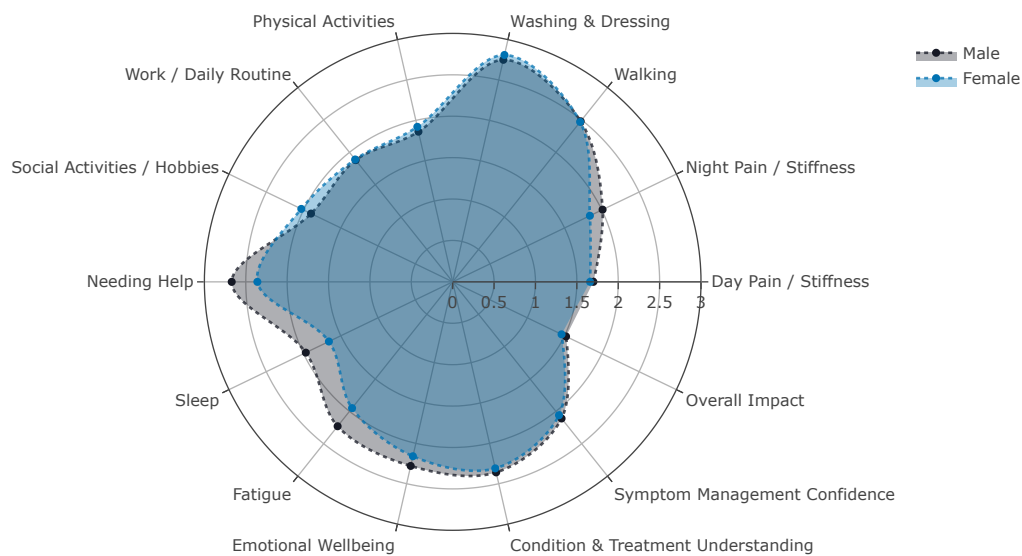


### 4.6.4 Average Individual Response Scores By Age Group

The visualisation below demonstrate the average score (between 0 to 4) for each of the 14 MSK-HQ items examined against the eight distinct age groups.
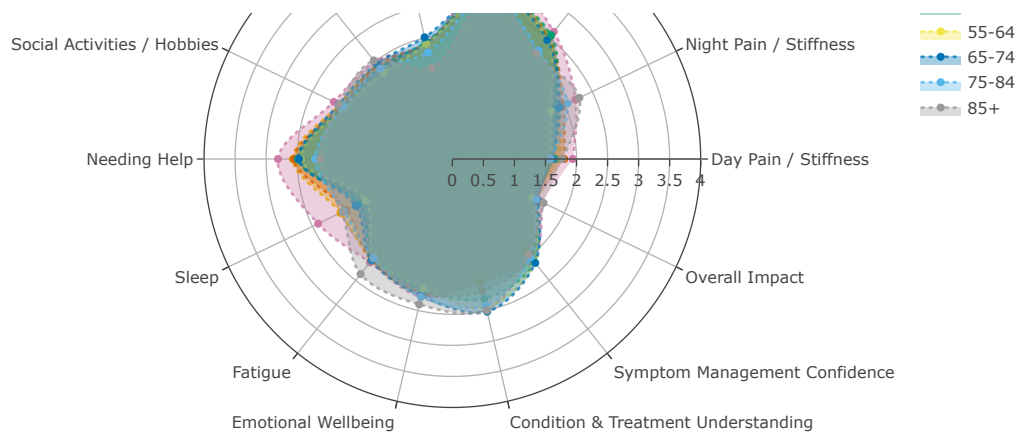
## 4.6.5 Average Individual Response Scores By Activity Level

The visualisation below demonstrate the average score (between 0 to 4) for each of the 14 MSK-HQ items examined against the reported activity level.