Self-harm contacts across healthcare settings in Wales

-an e-cohort study using routinely collected linked healthcare data

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KEY FINDINGS

1. Rates of self-harm are highest in non-specialist settings with trends varying by setting, age and sex.

2. For those aged **10-64** rates of self-harm were **highest in GP**; For those aged **65 and over** rates of self-harm were **highest in EDs**

3. **Both males and females** were more likely to present with self-poisoning than self-injury across healthcare settings

4. Self-harm rates were increasing prior to the pandemic for the population as a whole, but declined from 2020 to 2021. This varied by age and sex

5. **For females** incidence of self-harm increased in primary care from 2020-2021 but not for males. This varied by age group with increases driven by younger people

6. **For 10-18-year-olds** Incidence of self-harm increased for **females but not males** from 2020-2021; this was not the case for those aged 18 and over

7. Rates of self-harm varied by sex and setting for those aged **over 18** with a decrease is self-harm from 2020-2021 across most groups; GP settings showed the smallest decrease during the pandemic with the biggest decrease seen in EDs

8. Overall incidence of self-harm is **highest in the most deprived areas**; however, rates of self-harm **were increasing more steeply in more affluent areas before the pandemic**

9. **For 10–18-year-olds** incidence of self-harm **increased in 2020 and 2021** with larger increases in more affluence than more deprived areas, particulalry for ED attendances

KEY FINDINGS

10. Females, younger people, and those from more deprived areas were more likely to present with repeat self-harm and are more likely to present to multiple settings over time. Males are more likely to present to one setting only, most commonly ED.

11. Individuals from the two most deprived quintiles made up more than half of all self-harm events across healthcare settings.

12. Primary care/ GP and Emergency departments were important points of contact

13. 40% of self-harm events were recorded in GP only, with almost another third in EDs only.

14. Females are more likely than males to be admitted to hospital following ED attendance for self-harm, for post self-poisoning and self-injury

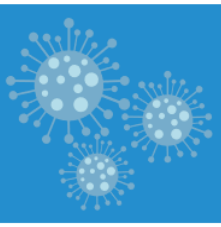
15. **Around a third of self-harm events were followed by an outpatient's appointment within 30 days; 'Did Not Attend' (DNA) rates vary by age, sex and deprivation.**

- Overall males are less likely to have an outpatient appointment within 30 days and when appointments were scheduled a larger proportion of males are recorded as DNA than females.
- The proportion of outpatient appointments scheduled did not differ by deprivation quintile, however a larger proportion of those in the most deprived areas than the least deprived areas did not attend their appointments

KEY IMPLICATIONS

1. Training and resources for non-specialist settings particularly primary care, in identifying, responding to and managing self-harm

2. Ensure provision of appropriate timely support for self-harm, responsive to changes in help-seeking behaviours during the pandemic and continue to monitor and understand these trends.



3. Children and young people (10-24 years) as a priority group.

- Tailored outreach and support is needed. Any contacts with healthcare settings should be optimized as an opportunity to intervene and provide support in a stepped care approach.

- Accessible timely mental health specialist support should be available when required (including psycho-social assessments, safety planning, evidence-based psychological therapies).

4. Care pathways and tailored support for males in Emergency Departments.

5. Steps to address high levels of non-attendance to outpatient appointments.

6. Improving outcomes for individuals living in more deprived areas.

7. Addressing trends in children from less deprived areas

8. Data quality improvement of recording of self-harm and interventions across allsettings but particularly in emergency departments.

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Glossary

Did not Attend (DNA). 'Did Not Attend' applicable to scheduled outpatients' appointments where attendance/non-attendance is recorded. Where children under 18 years are involved the term in use is "Was not brought"

Incidence. Defined as a record of self-harm where no self-harm was recorded within the previous 12 months.

Person Years At Risk (PYAR). A measure of 'exposure' or inclusion/ follow-up in the study. If an individual is registered with a SAIL supplying GP for one year, then they will contribute one year of follow-up time, or one PYAR. PYAR is a more appropriate unit than the number of registered cases because each individual's follow-up period is not fixed and varies.

Prevalence. Defined as a case where an individual has a record of self-harm in a given year regardless of whether there is a previous record of self-harm.

Recurrent or repeat self-harm. Defined as a recorded episode of self-harm which follows a previous recorded episode of self-harm.

Self-harm contact. Defined as a record of self-harm in one or more setting on a given date.

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Introduction

Background

We were commissioned by the NHS Executive to explore contacts for self-harm across health care settings- primary care (GP), Emergency Departments (EDs), hospital admissions and outpatients to inform the development of the new Suicide and Self-harm prevention strategy for Wales. Understanding who presents to each healthcare setting or settings for self-harm and, how this is changing over time, can inform policy and practice.

In Wales data across healthcare settings (GP, ED, hospital admissions and outpatients) is available in a privacy protected, secure and anonymised format for research through the Secure Anonymised Information Linkage Databank (SAIL databank) at Swansea University.

This report covers 2012-2021. In some sections we look separately at how trends were changing between 2012-2019, 2019-2020 and 2020-2021 to learn more about the effects of the pandemic and associated public health measures.

This report supplements previous research exploring self-harm contacts in children and young people from 2003-2015 ([1] *Appendix A*), and self-harm contacts during the pandemic ([2] *Appendix B*).

Aim

We examined electronic healthcare records from 2012-2021 to:

1. Explore trends in self-harm contacts across healthcare settings over time by healthcare setting, age, sex and deprivation.
2. Explore contacts to each health care setting/combinations of settings to understand patterns of contact.

Method

A retrospective e-cohort study was conducted using the SAIL databank at Swansea University. Individuals aged 10-100 years, registered with a SAIL supplying GP between 01.01.2012-31.12.2021 were included.

Incidence of self-harm over time, defined here as a record of self-harm where no other self-harm was recorded within the previous 12 months, across individual settings (GP, ED and hospital admissions) were explored.

Contacts with individual healthcare settings for self-harm were explored to assess presentation differences across groups and demands across each healthcare setting (GP, ED, hospital admissions and outpatients).

Previously developed and validated code lists and algorithms were used for identifying self-harm (https://conceptlibrary.saildatabank.com/concepts/C3292/detail/).

Ethical approval

Approval was granted by the Information Governance Review Panel (IGRP; approval number 1450). The IGRP oversees study approvals in line with permissions already granted to the analysis of data in the SAIL databank.

For full details of method see *Appendix C.*

Findings

A total of 3,682,586 individuals were included in our study, aged 10-100 years. They contributed 21,742,068 person years at risk (*Person* **Years At Risk**) during the study period (2012-2021).

Trends over time

1. ***Rates of self-harm are highest in non-specialist settings with trends varying by setting, age and sex.***

2. ***Overall rates of self-harm were highest for GP contacts.***

This was followed by ED attendances with hospital admissions representing the smallest proportion of events over the study period (*Figure 1*). This was the case across all age groups, apart from those aged 65 and over where rates were highest for ED attendances.

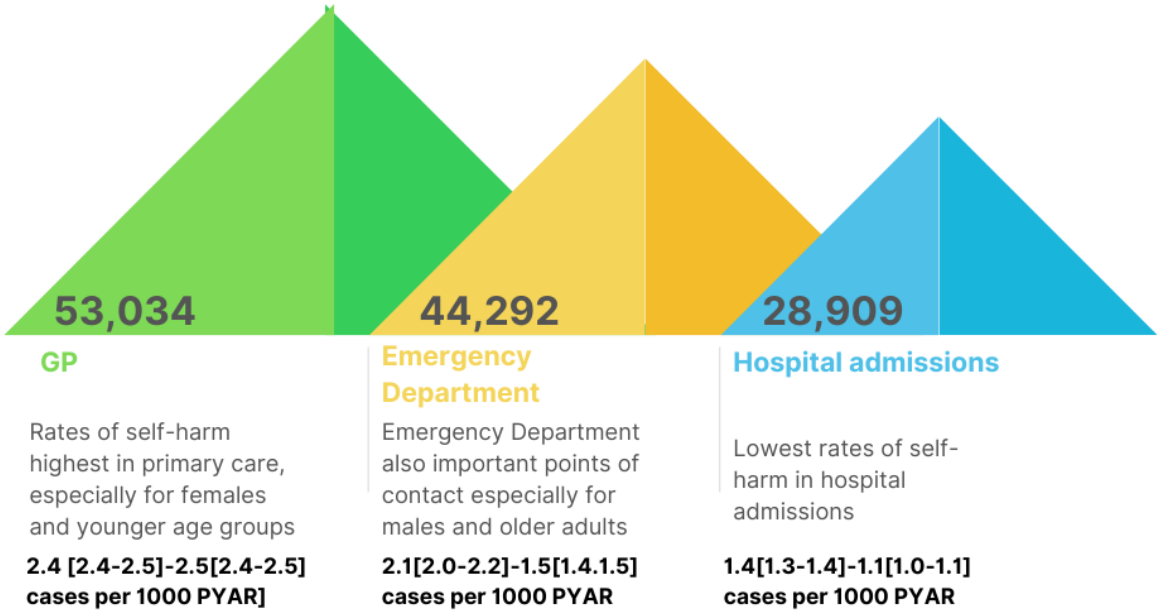


Figure 1 Number of incident self-harm events by healthcare setting

3. **Both males and females were more likely to present with self-poisoning than self-injury across healthcare settings**

Self-poisoning increased in GP from 2012-2019 declining from 2020 onwards and, admissions for self-poisoning declined consistently throughout 2012-2021 (*Supplementary Figure 1,Supplementary* Figure 2*,Supplementary* Figure 3*,Supplementary* Figure 4). Self-injury incidence in GP and hospital admissions showed an increase from 2012-2019 (GP 27.7%; Hospital admission 31.1%) & 2020-2021 (GP 10.1%; Hospital admission 1.2%).

However, it is important to note that rates of self-injury remain low compared to self-poisoning. GP attendances and hospital admissions for self-poisoning (*Supplementary Figure 5*) and self-injury (*Supplementary Figure 6*) were highest in females aged 10-18 years (GP self-poisoning – 11.1 [95% CI 10.9-11.2]; self-injury – 3.2 [95% CI 3.1-3.3]); (Admissions self-poisoning 5.8 [95% CI 5.6-5.9]; self-injury 1.3 [95% CI 1.2-1.4]). For males self-poisoning was highest in 19-34-year-olds (GP 4.7 [95% CI 4.6-4.8]); (Admissions 1.9 [95% CI 1.9-2.0]) and self-injury was highest in 10-18 year olds (GP 0.8 [95% CI 0.7-0.8]); (Admissions 0.3 [95% CI 0.2-0.3]).

4. ***Self-harm rates were increasing prior to the pandemic for the population as a whole but declined from 2020 to 2021.***

However, this varied by age and sex. See *Appendix B* [2] for more details on self-harm during the pandemic.

Overall, from 2012-2019 incidence of self-harm increased over time in GP and ED. Incidence of self-harm decreased across all settings in 2020. The onset of COVID-related restrictions began in the UK in March 2020 and as such a decline in rates in 2020 would be expected. There was a further decline in both EDs and hospital admissions from 2020-2021 (*Figure 2; Supplementary Table 1*).

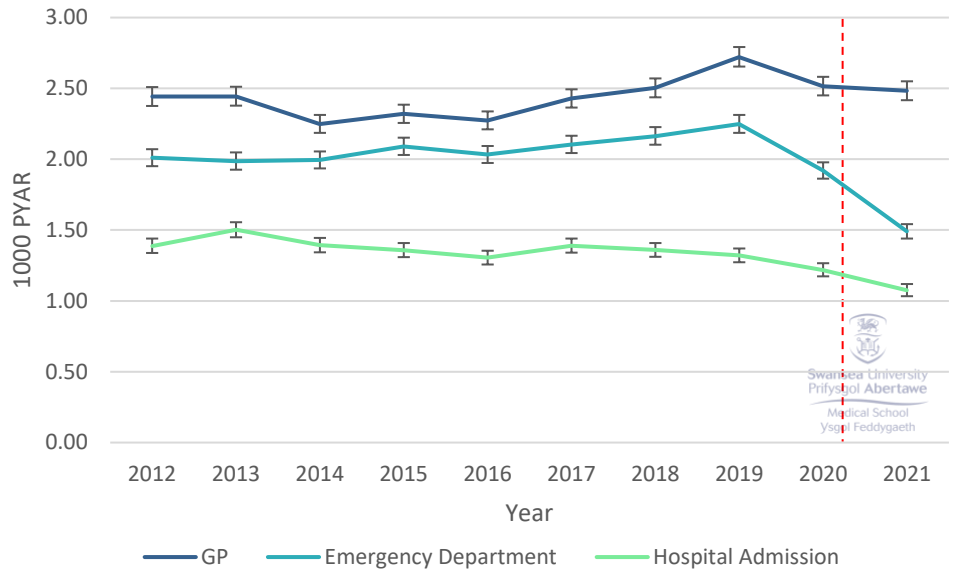


Figure 2 Incidence Rate of first self-harm event over the period of 2012-2021 stratified by setting (Red line represents onset of COVD-19 related restrictions March 2020)

5. ***Incidence of self-harm increased in primary care from 2020-2021 for females but not for males***

Across all settings rates of self-harm were higher in females than for males, with this sex difference smallest for ED attendances. For females, *rates of self-harm were increasing in both GP and ED attendances from 2012-2019*. There was an initial decrease (6.0%) in rates in 2020 followed by a 5.3% increase in GP incidence in 2021. This *was largely driven by an increase in self-harm in 10–18-year-old females* (see below). For other healthcare settings and across all settings for males, self-harm decreased in 2020 with a further decline in rates from 2020-2021.

6. ***Incidence of self-harm increased for 10-18-year-old females but not males from 2020-2021***

For females aged 10-18 rates of self-harm were increasing across all settings from 2012-2019. There was a slight decrease in GP contacts in 2020, a 10.4% decrease in ED attendances and a 5.4% increase in admissions. From 2020-2021 incidence of self-harm increased sharply across all settings particularly for GP contacts (increases across settings GP 26.1%, ED 10.9%, admissions 22.0%; *Figure 3*).

For male's, incidence of self-harm was increasing across all settings from 2012-2019 (GP 13.7%; ED 2.2%; Hospital Admissions 14.5%). In 2020 self-harm decreased across all settings with the smallest

decrease in GP (3.7%) and the largest in ED (26.5%) with a further decrease for both GP (0.5%) and ED (29.1%) and small increase (1.6%) in admissions from 2020-2021.

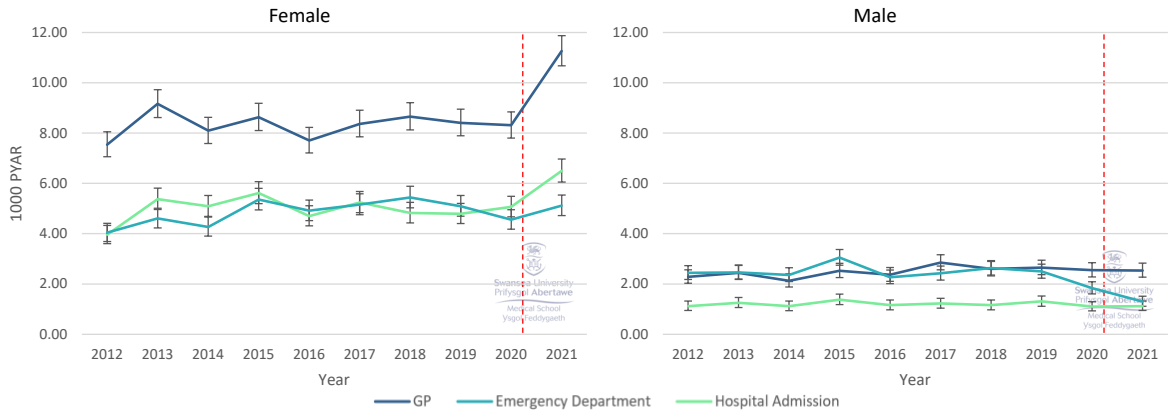


Figure 3 Incidence of self-harm over time in 10–18-year-olds stratified by setting and sex

7. ***Rates of self-harm varied by sex and setting for adults; GP settings showed the smallest decrease during the pandemic with the biggest changes seen in EDs.***

This builds on previous work finding that in April 2020 people who self-harmed were more likely to seek help in primary care compared to previous years (*Appendix B*).

19–34-year-olds**:* **From *2012-2019 incidence of self-harm was increasing for both males and females in GP and ED (Supplementary Table 2,Supplementary Table 3***)***. Hospital admissions increased by 5.5% for females with a 5.4% decrease for males. In 2020 incidence of self-harm decreased across all settings with a continued sharp decline from 2020-2021. Decreases in rates were smallest for GP settings and for females, and steepest for admissions.

35–64-year-olds: From 2012-2019 incidence of self-harm for GP increased for both sexes with a larger increase for males.* For *ED incidence decreased slightly in females and increased by 12.3% in males. Hospital admissions decreased for both sexes (Supplementary Table 2,Supplementary Table 3***,Supplementary*** Table 4***).*** In 2020 incidence of self-harm decreased across all settings apart from admissions for males where there was little change. Incidence continued to decrease across all settings for both sexes from 2020-2021 with the smallest decrease for GP settings and the largest for EDs for both sexes.

Over 65-year-olds: In contrast with younger age groups, ***incidence was highest in EDs for adults aged 65 and over. ED attendances decreased by almost half in individuals aged 65 years and over following the pandemic (Supplementary Table 3).***

It important to note that rates of self-harm were low in this age across settings for individuals aged 65 and over compared to other age groups, with rates ranging from 0.3-0.7 cases per 1000 PYAR depending on the setting and year. Rates were highest in EDs for this age group.

From 2012-2019 while incidence increased across all settings (apart from admissions for males). In 2020 incidence of self-harm in GP increased for females and decreased for males. ED attendances decreased for both sexes, whereas hospital admissions increased, particularly for females. From 2020-

2021 incidence of self-harm decreased across all settings, with ED attendances decreasing by almost half (females 43.4%, males 44.5%).

It is important to note that overall rates of self-harm in those aged 65 and over remained low and as such changes over time should be interpreted with caution. As rates of self-harm were highest in ED in this age group and these were increasing prior to the pandemic the dramatic decrease in 2020 and 2021 is a cause for concern as this likely reflects a decrease in help-seeking rather than a decrease in need.

8. **Incidence of self-harm is highest in the most deprived areas; however, rates of self-harm have increased more steeply in more affluent areas.**

Overall, from 2012-2019 there was little change in incidence of self-harm in GP and ED in the most deprived areas. In contrast in the most affluent areas GP contacts increased by 12.1% and ED by 20.9%. In the most deprived areas, admissions decreased by 11.5% whereas there was little change in the most affluent areas (*Figure 4*). This may reflect access issues since self-harm is generally more common in deprived areas or may reflect a change in pattern of self-harm.

From 2019-2020, incidence decreased across all settings in 2020 for those from both the most and least deprived areas, with a further decline from in 2021. In both the most and the least deprived areas the smallest decrease in incidence was in GP, with the largest decreases in ED.

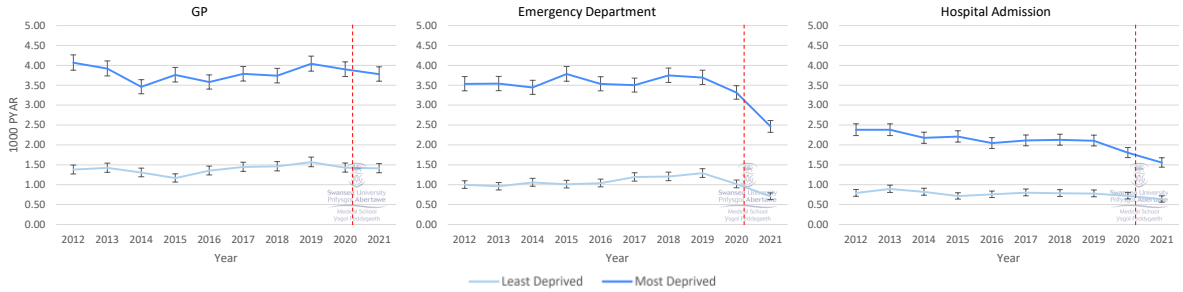


Figure 4 Incidence of self-harm over time stratified by setting and deprivation quintile

9. **For 10–18-year-olds there were increase across all settings for both the most deprived and the most affluent areas, with percentage increases larger in more affluent areas, particularly for ED attendances from 2012-2019 (*Figure 5*).**

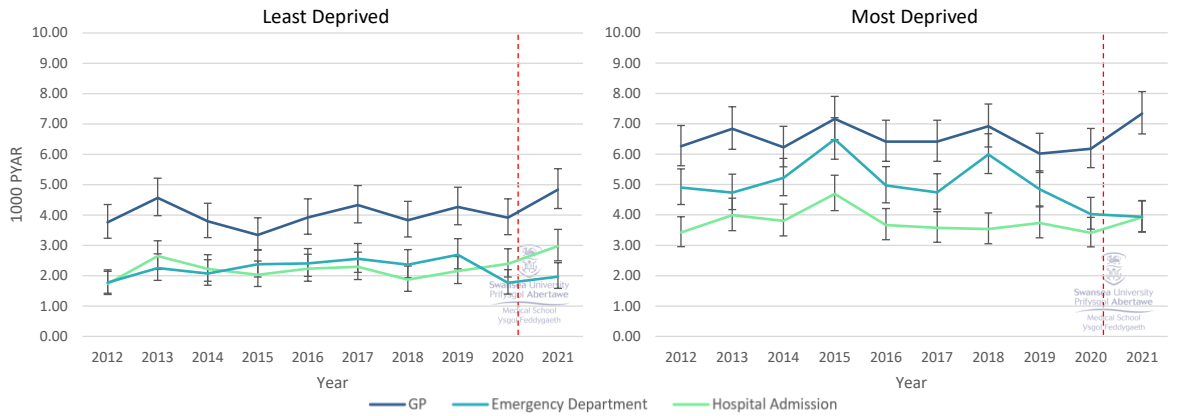


Figure 5 Incidence of self-harm over time in individuals aged 10-18 stratified by setting and deprivation

Incidence was lower for individuals aged 65 and overall rates were comparable between deprivation quintiles. However, individuals from the most affluent areas showed a larger decrease in ED and admissions from 2019-2020, with continued steeper decreases from 2020-2021 (*Figure 6*).

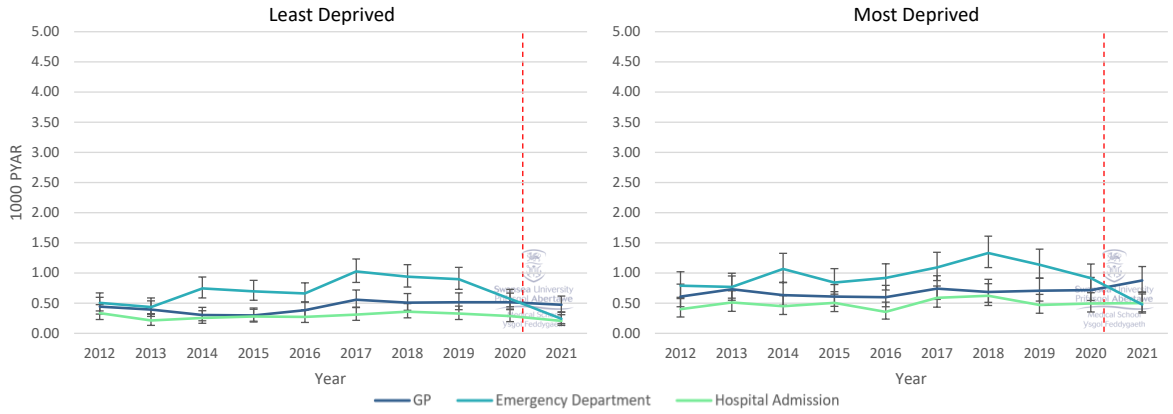


Figure 6 Incidence of self-harm over time in individuals aged 65+ stratified by setting and deprivation quintile

Contacts across healthcare settings

We explored 138,839 contacts with healthcare settings for self-harm from 67,594 individuals between 2012-2021.

10. ***Females, younger people, and those from more deprived areas were more likely to present with repeat self-harm and are more likely to present to multiple settings over time. Males are more likely to present to one setting only, most commonly ED.***

Children and young people were over-represented with around 40% of self-harm contacts in each healthcare setting for individuals aged 10-24 years across healthcare settings.

11. ***Individuals from the two most deprived quintiles made up more than half of all self-harm events across healthcare settings.***

12. **Primary care/GP and Emergency departments were important points of contact**

When an individual attends healthcare settings with self-harm, they may just attend one setting or they may attend across several (for example both ED and hospital admissions). We found that almost:

13. ***40% of self-harm events were recorded in GP only, with almost another third in EDs only***.

Hospital admissions made up a small proportion of self-harm events (***Error! Reference source not found.****; Supplementary Table 5*). Where individuals were admitted to hospital, 98.6% (98.6-98.7) were recorded as an emergency admission. Admissions for self-harm were most commonly under General Medicine. Almost all admissions for individuals aged 10-16 were under paediatric specialties. While

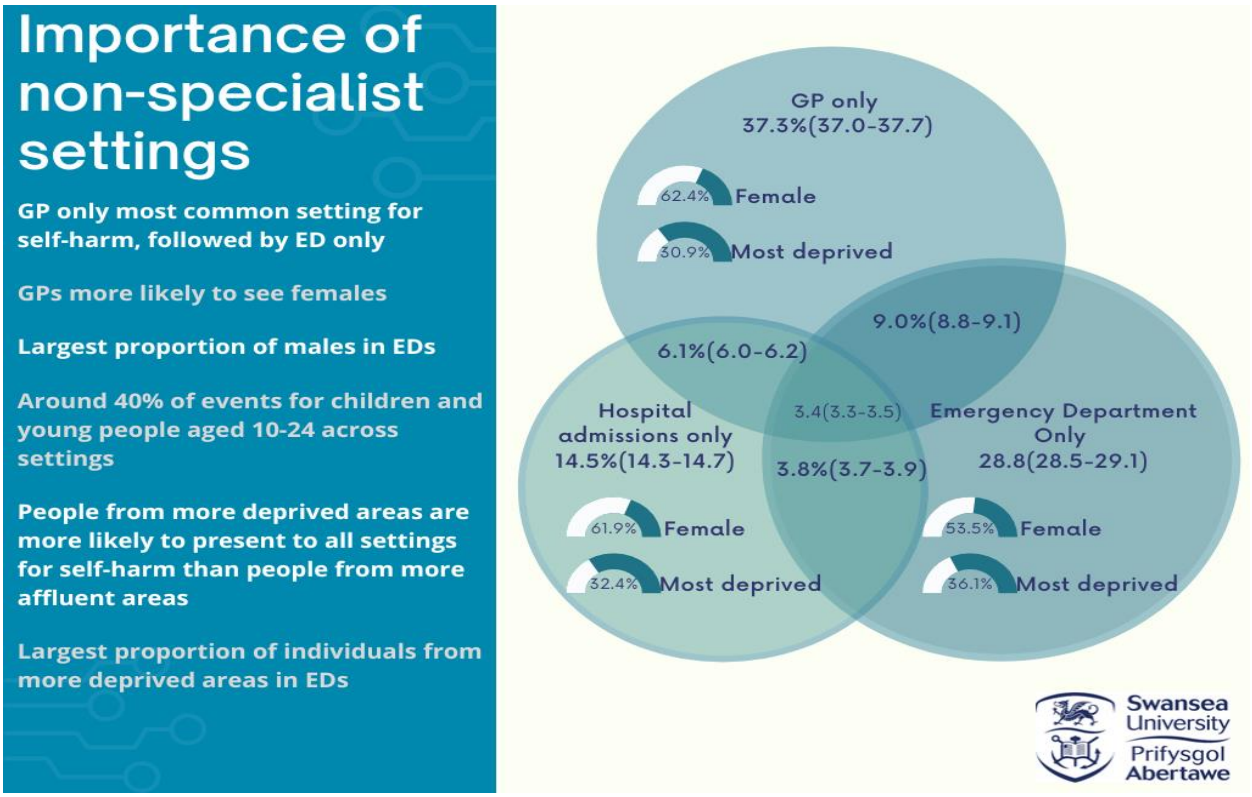


Figure 7 Self-harm events by setting(s)

admissions under Mental Health specialities were less common, when they did occur, they were associated with a longer length of stay in hospital (*Supplementary Table 6*).

14. **Females are more likely than males to be admitted to hospital following ED attendance for self-harm.**

We looked at hospital admissions in the 7 days following an ED attendance for self-harm.

The likelihood of being admitted to hospital following an ED attendance for self-harm varied by age and sex with 10–16-year-olds the most likely to be admitted and having the biggest sex disparity with a larger proportion of female than male attendances resulting in admission (10-16 years Females 61.6%[59.4-63.9], Males 37.2%[34.3-40.3]; *Figure 8*). This was the case for both attendances with self-poisoning where 78.6%(75.1-82.2) of females aged 10-16 were admitted compared with 56.3%(50.2-62.9) of Males and, for self-injury where 46.1%(40.8-51.9) of females were admitted compared with 38.7%(34.7-42.9) of males (*Supplementary Table 7*).

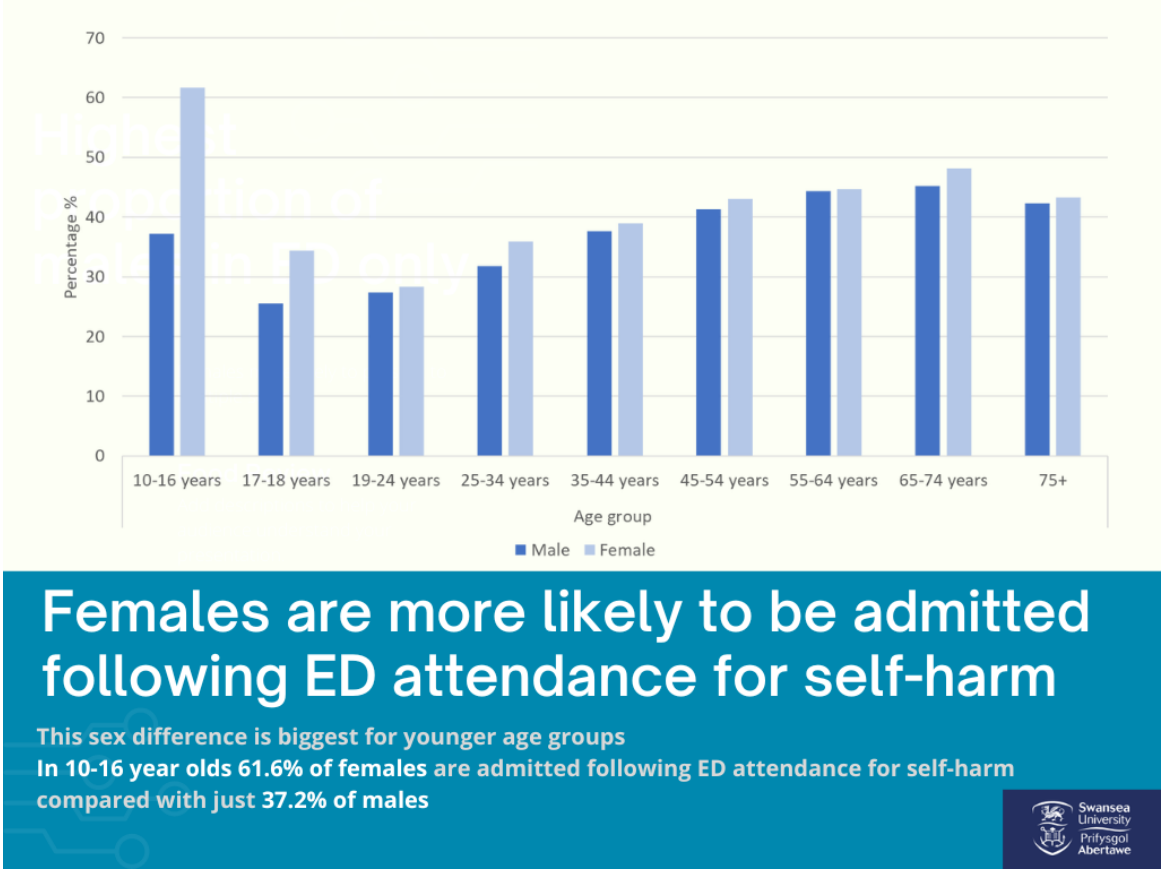


Figure 8 Percentage of ED attendances for self-harm with an associated hospital admission within 7 days stratified by age and sex

15. **Around a third of self-harm events were followed by an outpatient's appointment within 30 days; 'Did Not Attend' (DNA) rates vary by age, sex and deprivation.**

Overall, 32.2% (31.9-32.5) of self-harm events were associated with an outpatient's appointment within 30 days. Of these 28.8% (28.3-29.3) had an appointment recorded as DNA. Appointments scheduled under Paediatric or Mental Health specialities had the lowest DNA rates, while those scheduled under General Medicine has the highest (*Supplementary Table 8*).

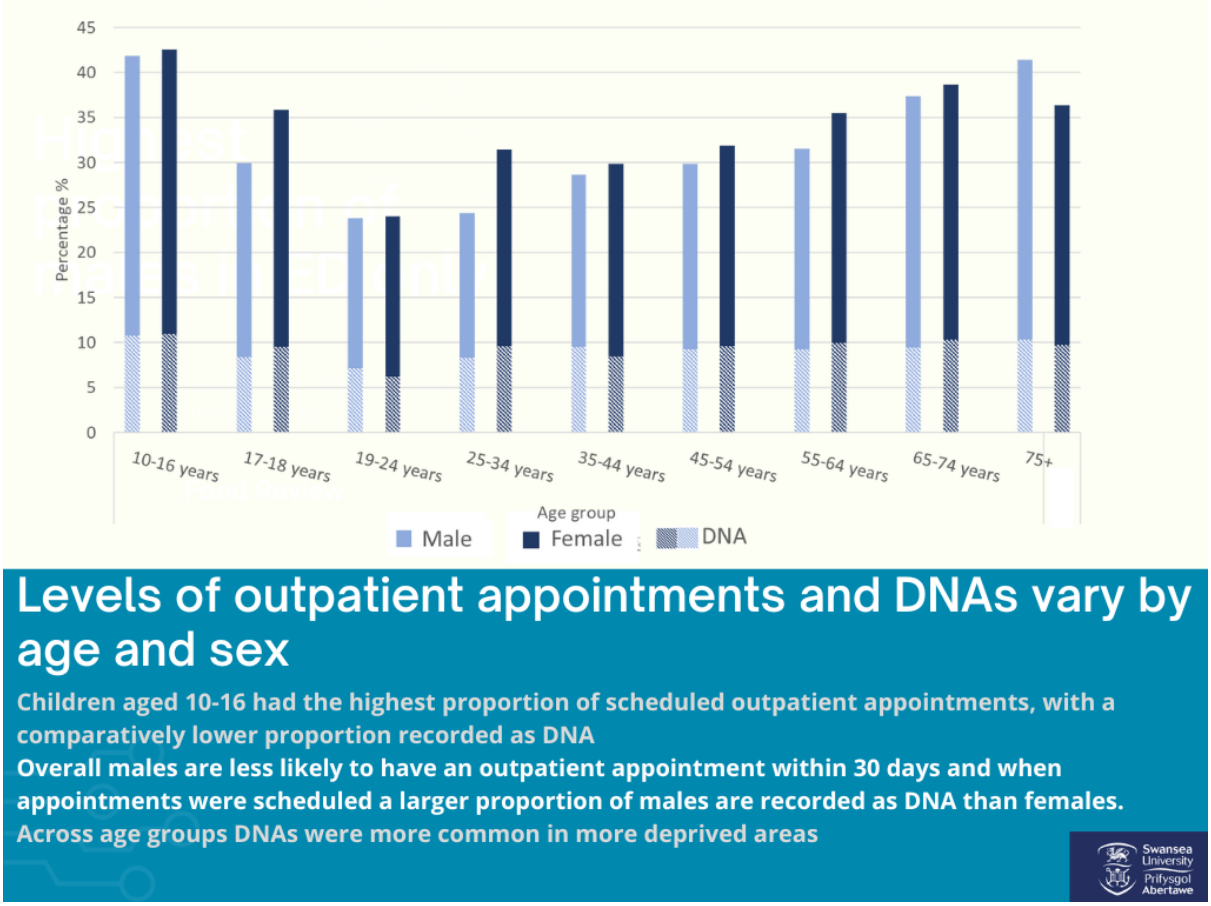


Figure 9 Percentage of self-harm events with an associated outpatient appointment stratified by age and sex

Individuals aged 10-16 were most likely to have an outpatient appointment with 43.4% seen within 30 days. Those aged 19-24 least likely to have an outpatient appointment. When an outpatient appointment was scheduled those aged 25-34 were the most likely not to attend with 32% having a DNA recorded (***Error! Reference source not found.***; *Supplementary Table 9*).

Overall males are less likely to have an outpatient appointment within 30 days and when appointments were scheduled a larger proportion of males are recorded as DNA than females. This sex difference in DNA rates is largest for those aged 25-34 years.

The proportion of outpatient appointments scheduled did not differ by deprivation quintile, however a larger proportion of those in the most deprived areas than the least deprived areas did not attend their appointments with 31.3% (30.4-32.2) of individuals in the most deprived areas recorded as DNA compared with 25.0% (23.6-26.5) of those in the most affluent areas. These results should be interpreted with caution given data quality issues.

Implications

1. ***Training and resources for non-specialist settings particularly primary care.***

Non-specialist services (GP and ED) are frequent points of contact. Rates here are increasing over time from 2012-2021 for some populations (namely females aged 10-18 years in GP and ED); males aged 10-18 year (in GP); 19–34-year-olds (in GP); and 65+year (in GP's). It is important that professionals in these services are supported in their ability to identify, respond to, and manage individuals who self-harm.

The smallest decreases in incidence of self-harm during the pandemic was for GPs, with the largest decreases for EDs. This further highlights the importance of primary care as an accessible point of contact. Ensuring that primary care staff have the training and resources to adequately support individuals may improve outcomes and, potentially, reduce presentations to ED. This would include educational training for awareness, understanding and practice (formulations of risk, psychosocial assessment, safety planning), co-designed guidance on responding to those who self-harm, criteria to refer for specialist care, clear care pathways and, the timely availability of cross- sectoral services when referrals are made.

2. ***Ensure provision of appropriate timely support for self-harm, responsive to changes in help-seeking behaviours during the pandemic and continue to monitor and understand these trends.***

In individuals aged 19 and over, rates of self-harm were increasing across settings prior to the pandemic with a decrease following the introduction of restrictions. This most likely reflects a reduction in help-seeking (fear of infection, wanting to protect the NHS) and not a reduction in need. For individuals aged 65 and over rates of self-harm were highest in ED and were increasing prior to the pandemic. Rates of self-harm in EDs decreased by nearly half in this age group from 2020-2021.In contrast for individuals aged 10-18 years there was sharp increase across all settings from 2020-2021 (discussed further below).

Further research is needed over the coming years to explore how these trends evolve. It is important that individuals are encouraged to seek help for self-harm and that both specialist and non-specialist healthcare settings have the resources to provide support to people when they do present.

Where self-harm decreased during the pandemic, the smallest reductions in incidence were in primary care settings, with an increase in GP contacts seen for 10–18-year-old females and males aged 65 and over. This is in keeping with previous research ([2] *Appendix B*) and likely reflects accessibility of services during the pandemic and messaging encouraging people not to attend hospital. This further highlights the importance of primary care as a point of contact.

While rates of self-harm were higher overall in the most deprived areas, prior to the pandemic rates were increasing faster in the most affluent areas. Furthermore in 10–18-year-olds increases in self-harm from 2020-2021 were steepest for those from the most affluent areas, particularly for EDs.

Further research is needed to explore why this is the case and whether this reflects accessibility of services, differences in help-seeking behaviour or genuine differences in rates of self-harm. For 10–18-year-olds increases in self-harm presentations to healthcare settings may reflect differences in help-seeking both by the individuals and by parents. It is important to fully understand the reasons behind these differences in trends by deprivation indices to better understand inequalities, levels of unmet need for support and, to plan adequate service provision.

3. Children and young people (10-24 years) as a priority group.

Rates of self-harm in young people aged 10-18 were increasing prior to the pandemic (2012-2019), however rates in females increased more sharply in 2020 and 2021 (for example GP contacts for self-harm increased by 10.2% from 2012-2019, and by 26.1% in 2020-2021). The same trend was not seen in males, in fact there was a decrease in ED attendances in 2020 and 2021. It is important to consider trends over time prior to COVID when considering how the pandemic and restrictions may have interacted with pre-existing factors and how additional stressors may have affected young people. Tailored outreach and support is needed. Any contacts with healthcare settings should be optimised as an opportunity to intervene and provide support in a stepped care approach. Accessible timely mental health specialist support should be available when required (including psycho-social assessments, safety planning, evidence-based psychological therapies).

Despite high rates of self-harm in those aged 19-24 they were the age group least likely to be admitted to hospital following ED attendance for self-harm and, the least likely to be seen in outpatients in the 30 days following a self-harm event. The importance of appropriate follow-up care in this age group should be highlighted.

4. Care pathways and tailored support for males in Emergency Departments.

Males preferentially present to EDs for self-harm and are less likely than females to present to other settings. However, males attending EDs with self-harm are less likely to be admitted to hospital than females following ED attendance. This is especially the case for 10–16-year-olds and is true for attendances with both self-poisoning and self-injury.

Based on this data it is not clear why this is the case. However, this does highlight the importance of non-specialist services as points of contact and the need for ED clinicians to have training and guidance on how best to provide care and onward referral for individuals who present with self-harm, as well as appropriate care pathways. Current NICE guidance for the management of self-harm and suicide prevention should be implemented. Steps to encourage males to seek help outside of emergency settings could also be considered.

5. *Steps to address high levels of non-attendance to outpatient appointments.*

Around a third of individuals had an outpatient appointment scheduled within 30 days of a self-harm contact with GP, ED or an admission (others may well have been seen by CRISIS teams), however non-attendance rates were high. Overall males, individuals aged 25-34 years and individuals in those most deprived areas had the highest proportion of DNAs recorded.

It is unclear from this data why DNAs are so common- while it might reflect a crisis passing with time to appointment, it is likely the need for a comprehensive psychosocial assessment remains. However, steps to improve attendance such as flexibility in appointment times and availability of telephone or online appointments should be considered. The impact of these additional steps on repeat self-harm rates should be evaluated.

6. Improving outcomes for individuals living in more deprived areas.

Individuals living in the most deprived areas are over-represented across all settings for self-harm. Individuals from more deprived areas were more likely to present with repeat self-harm and to contact multiple settings. The impact of socio-economic inequalities on suicide and self-harm should be acknowledged and addressed across strategies and initiatives.

Levels of outpatient appointments were comparable across deprivation quintiles however when appointments were scheduled, DNA rates were highest in the most deprived areas. Improving accessibility for example, offering more flexible appointment times or greater availability of online or telephone appointments may improve attendance rates and equity of care.

7. ***Addressing trends in children from less deprived areas***

In 10-18-year-olds, increases in self-harm contacts from 2020-2021 were higher in the most affluent areas. Further research is needed to explore the underlying reasons for this difference. In 10-18-year-olds contacts with healthcare settings may reflect awareness and help seeking by parents. The difference between the most and least deprived areas may also reflect accessibility of settings. Further research is needed to explore help-seeking and potential levels of unmet need and, how support can best be tailored.

8. ***Data quality improvement of recording of self-harm and interventions across all settings but particularly in emergency departments.***

There are known issues with consistency of coding in ED data with a mix of ED specific and ICD-10 coding used and inconsistent recording and reporting of mental health and self-harm events in some health boards. This means that the counts presented here are likely an underestimate. This limits our ability to fully explore the support needed in this setting. Steps to improve recording of self-harm in all settings but especially EDs, are important to drive improved management and outcomes, inform service design and conduct need assessments. Improved ED data is particularly relevant to outcomes for males and older adults who are less likely to contact other healthcare settings.

Steps to improve recording of self-harm may include: specific guidance on coding across Wales to improve consistency; encouragement, training and rewards to consistently record self-harm attendances to allow accurate monitoring; creation of an ED based SH register, as exists in England and Ireland, to monitor care.

Strengths and limitations

This report provides evidence on which to base targeted resources, intervention, and service provision. Derived from a large representative population of individuals aged 10 and over studied over 10 years, results are generalisable to the rest of the UK. This report further builds on previous work exploring contacts for self-harm in children and young people ([1] *Appendix A*), and self-harm contacts during the pandemic ([2] *Appendix B*).

This study is based on routinely collected data. It benefits from well-documented, validated, and curated lists of Read and ICD-10 codes and previously developed algorithms for identifying self-harm in ED data. Findings presented here reflect contacts with the healthcare system and will be an underestimate of self-harm in the community. This is a common feature of all studies utilising routinely collected data.

Up to 14 diagnoses can be recorded per hospital admission, as such self-harm may not be the primary reason for admission. While we examined the admission speciality, it was not possible to examine whether an individual was admitted to a general medical or psychiatric hospital. In addition, whether an ED attendance for self-harm is associated with a hospital admission, is based on whether an admission occurs within 7 days after an ED attendance. As such we cannot be certain if an admission was a direct result of ED attendance.

There are known issues with consistency of coding in ED data. We have sought to minimise the impact of this here utilising a combination of both validated ED specific algorithms and ICD-10 coding. However, numbers here likely under-estimate the true extent of ED attendances for self-harm. Further work is planned to improve the accuracy of this algorithm. In addition, steps to improve coding consistency in EDs as detailed in the implications section above would improve future monitoring of self-harm in EDs.

References

1. Marchant, A., et al., *Self-harm presentation across healthcare settings by sex in young people: an e-cohort study using routinely collected linked healthcare data in Wales, UK.* Archives of disease in childhood, 2019: p. archdischild-2019-317248.
2. DelPozo-Banos, M., et al., *Healthcare contacts with self-harm during COVID-19: An e-cohort whole-population-based study using individual-level linked routine electronic health records in Wales, UK, 2016—March 2021.* PloS one, 2022. **17**(4): p. e0266967.

Appendix A

Self-Harm and Healthcare Over Time in Children and Young People

Self-harm and healthcare over time in children and young people

THE PROBLEM

Self-harm is a major public health concern. Self-harm in young people is not rare. One in four girls and one in seven boys aged 14 who responded to a survey said they had self-harmed in the previous year. The importance of giving young people who self-harm the right care and support cannot be understated.

Young people aged 10-19 with a history of self-harm are more than ten times as likely to die of unnatural causes and seventeen times more likely to take their own lives. Children who have self-harmed spend less time in school with more absences and exclusions. They are also more likely to have a range of other negative physical and mental health outcomes. If we can offer young people the right care and support, it is possible to change, and even save lives.

THE RESEARCH

The team used routinely collected healthcare data for the whole population of Wales to learn more about how children and young people use the healthcare service for self-harm. They wanted to learn more about how many see their GPs, go to emergency departments, are admitted to hospital or seen in outpatients. The team wanted to know more about how children and young people were looked after and whether this has changed over time.

As part of their study, the team also investigated whether there were differences according to the sex of the child or young person, their age or whether they came from an affluent or deprived area.

THE RESERACHERS

Dr Amanda Marchant
Senior Research Analyst

Professor Ann John
Principal Investigator

"Our study, which analysed data from different healthcare settings, reveals high rates of self-harm in primary care and among young males in emergency departments. The difference in admissions from emergency departments between boys and girls is important. It is important that we make the most of emergency departments attendances to offer help."

Dr Amanda Marchant
Senior Research Analyst

MQ Mental health research · Adolescent Mental Health DATA PLATFORM · UKRI Medical Research Council · SAIL DATABANK

To read more about this study, click here

THE OUTCOMES

- GPs were an important source of help and support. More children and young people saw their GP than contacted any other healthcare setting
- Hospital admissions increased over time for 10-14 year olds
- Emergency department attendances increased for 10-19 year olds
- Boys and young men tend to seek help from emergency departments more than from any other healthcare setting
- Girls and young women were more likely to be admitted to hospital after attending emergency departments for self-harm. This was true even for those aged under 16 where admission is always recommended to allow for a full risk assessment

THE IMPACT

- These findings are important for planning service provision. For example, in emergency departments
- This study highlights how important GPs are for supporting young people who self-harm
- Emergency departments are an important place to offer help. This is especially true for boys and young men
- Children and young people often contact services that do not specialise in self-harm or mental health
- Any contact with healthcare settings is an opportunity to help a potentially vulnerable young person so it is important that we make the most of these opportunities
- Doctors and healthcare workers need to have the right information and support to be able to offer young people the support they need and to decide when referral to more specialist care is needed
- Clinical guidelines recommend that anyone aged under 16 is admitted to hospital if they attend emergency departments for self-harm. This is so that they can be assessed for risk. The differences in admissions between boys and girls is important. An emergency department attendance is a chance to offer help and it is important that we make the most of this.

STRENGHTS AND LIMITAITONS

This study examines self-harm in different healthcare settings using information from GPs, the emergency room, and hospitals, which provides a detailed view. The findings are based on a large group of people, making them likely to apply to similar groups. The study also has limitations: it doesn't break down different ways people self-harm, there's uncertainty about whether hospital stays were directly related to visiting the emergency room, and there might be issues with data quality for certain years. Additionally, the study only looked at cases where healthcare professionals recorded self-harm, so we might miss self-harm that was talked about with a doctor but where this wasn't put in someone's healthcare records. Changes in how information is recorded, and better recognition of self-harm could affect the results.

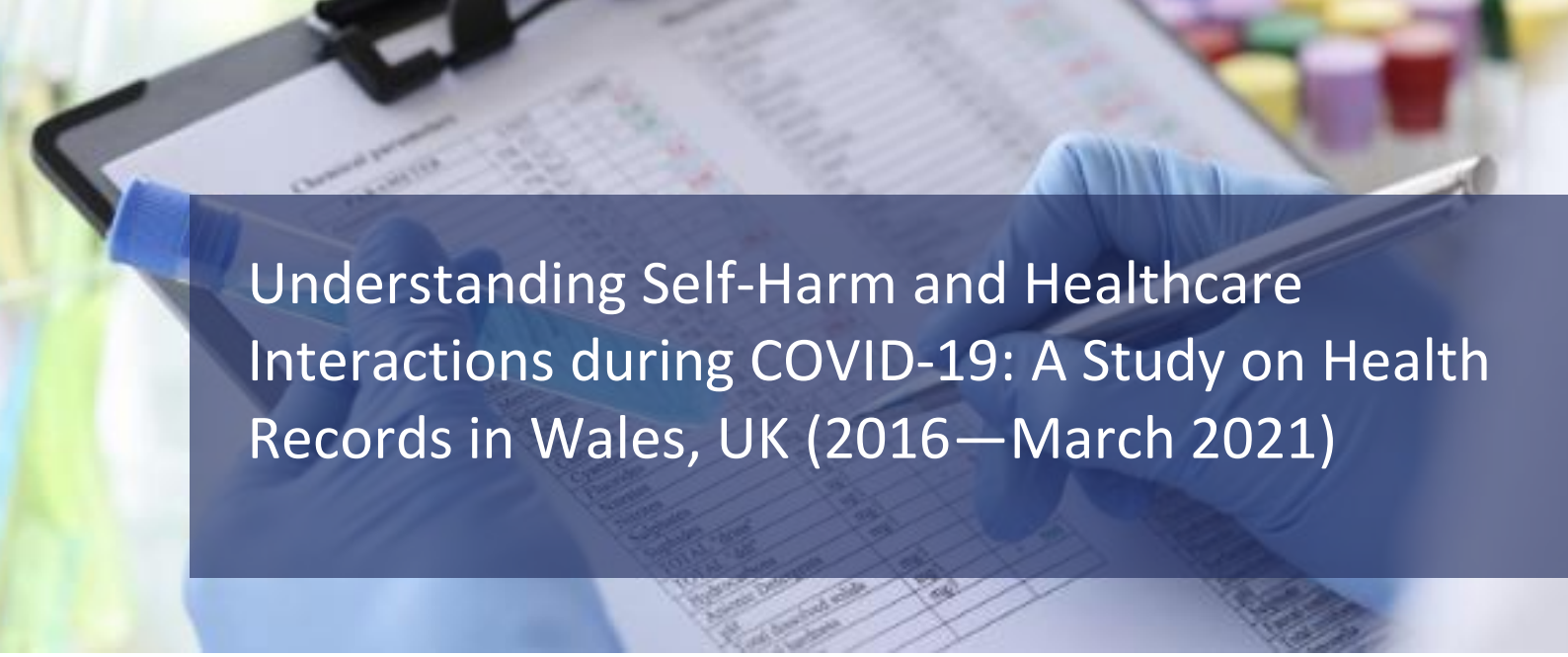
" This study showed that it is likely that responses from services to males and females, even as children, who have self-harmed and are in distress may be different. We very much focus on improving help-seeking for males but we also need to think about what happens when they do"

Professor Ann John
Principal Investigator

To read more about this study, click here

Appendix B

Understanding Self-Harm and Healthcare Interactions during COVID-19: A Study on Health Records in Wales, UK (2016-March 2021)



Understanding Self-Harm and Healthcare Interactions during COVID-19: A Study on Health Records in Wales, UK (2016—March 2021)

THE PROBLEM

When the COVID-19 pandemic started, people were worried about the impact it might have on mental health, including self-harm. Some studies suggested that self-harm and suicidal behaviours could increase during the pandemic, while others found a decrease in people seeking help for self-harm. In the UK, there was a drop in primary care visits and referrals for self-harm initially, but they later went back to normal levels. However, these studies only looked at specific places and groups of people and mostly focused on the first wave of the pandemic. To get a better understanding, we looked at data from different healthcare settings in Wales, UK, throughout both waves of the pandemic and compared it to previous years before the pandemic.

THE RESEARCH

We used data from 3,552,210 people living in Wales, of age 10 years and older, between January 2016 and March 2021. This information came from a database that keeps data private and doesn't reveal personal details. We looked at contacts with primary care, emergency department visits and hospital admissions, and identified those where self-harm was recorded. We compared healthcare contacts with self-harm during the pandemic with those before.

THE RESEARCHERS

Marcos Del Pozo Baños
Senior Researcher

Professor Ann John
Principal Investigator

"Fear of infection, stay at home orders and 'protect the NHS' may have discouraged people who self-harm from accessing healthcare services during the COVID-19 pandemic. We need to encourage open communication and promote help seeking, to ensure that individuals who self-harm receive the help they need."

Dr Marcos del Pozo Baños
Senior Researcher

HDRUK Health Data Research UK

MQ Mental health research

UKRI Medical Research Council

SAIL DATABANK

To read more about this study, click here

THE OUTCOMES

- The number of self-harm contacts decreased in March and December 2020 compared to previous years.
- In primary care, contacts for self-harm decreased more than for other reasons.
- Self-harm contacts decreased less than non-self-harm contacts in emergency departments during April 2020, and in hospital admissions during April-May 2020.
- In April 2020, people who self-harmed were more likely to seek help in primary care than in previous years.
- In December 2020, individuals who presented with self-harm to emergency departments were less likely to be admitted to hospital than in previous years.

THE IMPACT

For people	During the COVID-19 pandemic, it may have been harder for individuals who self-harm during pandemics to seek help, particularly young women and older men to get help from primary care.
	Individuals who self-harmed were more likely to seek help in emergency departments and hospitals during certain periods.
For policy	During pandemics, policymakers should ensure sufficient resources and support across healthcare services to provide appropriate assessment and intervention to in primary care and other
	Campaigns, such as "Protect the NHS", should avoid discouraging people who self-harm or with mental health difficulties from contacting healthcare services.
For practice	Healthcare providers should continue to support people who do seek help after self-harming, particularly with hospital admissions following emergency department presentations with self-harm.

LIMITATIONS

The study used routine data and examined the level of deprivation in different areas before the pandemic, without considering how the pandemic might have changed factors like income and employment. Reliable definitions were used to prevent errors. Some analyses could not be extensive due to limited data. The study can imply cause and effect if specific conditions are satisfied, but verifying these conditions is challenging. Significant factors such as financial status and social isolation were not fully considered, which makes it less certain how different aspects are linked.

"In any future pandemics we need to really think about messages regarding seeking help for self-harm and consistent provision of support and follow-up for those who do. Missing out on talking therapies, psycho-social assessments and safety planning may impact people's future trajectories."

Professor Ann John
Principal Investigator

To read more about this study, click here

Appendix C
Detailed methods

Data Source
This is a whole population-based e-cohort study of routinely collected healthcare data utilising data held within the SAIL databank (www.saildatabank.com).

Study Population
We will use multiple datasets linked at patient level (Table 1).
Table 1 Description of datasets

Dataset	
Welsh Demographic Service Dataset (WDSD)	Register of all individuals registered with a Welsh GP, included anonymised demographic information, address and practice history. Full Wales coverage from 1990 onwards
Welsh Index of Multiple Deprivation (WIMD)	Deprivation scores for all lower super output areas in Wales. Wales coverage from 1990 onwards.
Welsh Longitudinal General Practice Database (WLGP)	Containing information for all GP interactions covering 79% of the Welsh population from 2000 onwards
Emergency Department Dataset (EDDS)	Containing data for all NHS Wales ED attendances (34 sites including minor injuries units). Complete data from 2012 onwards
Patient Episode Database for Wales (PEDW)	Containing data for all NHS Wales hospital admissions. Full Wales coverage 1995 onwards
Outpatients data (OPD)	Data for outpatients appointments. Full Wales coverage 2004 onwards
Annual District Death Extract (ADDE)	ONS deaths register; register of all deaths relating to Welsh residents including those that died outside of Wales

Individuals were aged 10 - 100 and registered with SAIL, supplying GP from 01.01.2012 – 31.12.2021 were included.
Data collection will begin 1 year after GP registration, 10th birthday or study onset whichever is the latest. Data collection will end on the date of GP deregistration, death, 100 years old, or study end whichever is the sooner. Individuals can supply multiple data periods.

Measures
For incidence and prevalence analysis age and deprivation indices will be collected based on the data collection onset each year. For the contacts across services age and deprivation will

be based on the first self-harm date. Age will be categorized into the following age bands: 10-16; 17-28; 19-24; 25-34; 35-44; 45-54; 55-64; 65+
We used code lists to capture self-harm across settings developed by the team previously (https://conceptlibrary.saildatabank.com/concepts/C3292/detail/). A standard coding system is employed across EDs in Wales, grouping by attendance type and diagnosis. While this does not contain the diagnostic detail of ICD-10 and Read codes, this is sufficient for identifying self-harm. Self-harm was defined as an attendance recorded as 'deliberate self-harm' along with diagnostic codes of undetermined intent with selected co-occurred diagnoses (e.g., lacerations, poisoning) in keeping with previous research [1] *Appendix A*.

Trends over time

Incidence will be defined as no self-harm recorded within the previous 12 months. Incidence over time will be explored by healthcare setting, age group, sex, deprivation and method of self-harm (divided into self-poisoning or self-injury).
Individuals were counted once per year during the study period, this type of analysis is known as person-based analysis. A person-based analysis is useful to measure the number of people within a population that may have a contact with healthcare setting for a specific condition. It doesn't, however, provide an insight into the pressures on services as an individual admitted on numerous occasions would appear only once here.

Contacts across services

Presentations to each service from self-harm from 01.01.2012 – 31.12.2021 will be identified. This is the maximum period where data coverage is available across all settings. This represents an events-based analysis with each self-harm event in each setting recorded (in contrast with the person-based analysis above). This allows for insight into pressures on services.
Datasets will be linked at the level of the individual. Participants and self-harm events will be divided into mutually exclusive groups based on the service(s) to which they presented (e.g. GP only, GP and ED and so on). Age and deprivation data will be taken from the first self-harm presentation during this time. A self-harm event will be defined as a record of self-harm in one or more service on a given date.
Self-harm method will be examined. Each participant can have multiple events across services. Admission speciality will be examined. This is the specialty under which the patient is treated and is either the consultants main specialty or a different specialty function which is the consultants interest specialty function. These specialties will be broadly grouped into the following categories:
'Surgical specialties' which includes all surgical specialties (e.g. general, plastic etc), with the exception of paediatric surgery which was categorized under 'paediatrics' and 'accident and emergency surgical speciality' which was examined separately;
'Paediatric specialties', encompassing all paediatric specialties with the exception of child and adolescent psychiatry;
'Mental Health', which consists of all psychiatric specialties (e.g., psychiatric intensive care, eating disorders and so on, including child and adolescent psychiatry);
'General Medicine'
'Other', encompassing all other medical specialties
Admission to hospital within 7 days of ED attendance will be examined as a measure of whether an ED attendance resulted in admission. A 7-day window allows for an individual to

remain in ED prior to admission and for delays in data recording. Whether an individual was seen in outpatients and by which speciality in the 30 days following self-harm was examined.

Data analysis

The SAIL databank was interrogated using SQL DB2. Annual incidence rates were calculated using person years at risk (PYAR) as a denominator. PYAR is a more appropriate unit than the number of registered cases because each individual's follow-up period is not fixed.

Information Governance

Approval was granted by the Information Governance Review Panel (IGRP; approval number 1450). The IGRP oversees study approvals in line with permissions already granted to the analysis of data in the SAIL databank.

Supplementary Tables

Supplementary Table 1 Incidence rate and event counts of Self-harm from 2012-2021, stratified by healthcare setting.

		Primary Care		**Emergency Department**		**Hospital Admissions**	
		Counts	Incidence Rate (95% CI)	Counts	Incidence Rate (95% CI)	Counts	Incidence Rate (95% CI)
Year	2012	5197	2.4(2.4-2.5)	4443	2.1(2.0-2.2)	2953	1.4(1.3-1.4)
	2013	5199	2.4(2.4-2.5)	4309	2.0(2.0-2.1)	3194	1.5(1.4-1.6)
	2014	4815	2.2(2.2-2.3)	4342	2.0(2.0-2.1)	2983	1.4(1.3-1.4)
	2015	5015	2.3(2.3-2.4)	4581	2.1(2.1-2.2)	2936	1.4(1.3-1.4)
	2016	4947	2.3(2.2-2.3)	4507	2.1(2.0-2.1)	2839	1.3(1.3-1.4)
	2017	5333	2.4(2.4-2.5)	4784	2.2(2.1-2.2)	3051	1.4(1.3-1.4)
	2018	5442	2.5(2.4-2.6)	4889	2.2(2.2-2.3)	2955	1.4(1.3-1.4)
	2019	5987	2.7(2.7-2.8)	4973	2.3(2.2-2.3)	2905	1.3(1.3-1.4)
	2020	5601	2.5(2.5-2.6)	4223	1.9(1.8-2.0)	2712	1.2(1.2-1.3)
	2021	5498	2.5(2.4-2.5)	3241	1.5(1.4-1.5)	2381	1.1(1.0-1.1)

Supplementary Table 2 Incidence rate of Self-harm from 2012-2021, stratified by sex and age-group in Primary Care.

		Primary Care stratified by Sex and Age Group							
		10 – 18 Year old		19 – 34 Year old		35 – 64 Year old		65+ Year Old	
		Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)	Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)	Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)	Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)
Year	2012	2.3(2.0-2.6)	7.5(7.1-8.1)	3.8(3.5-4.0)	4.0(3.8-4.3)	1.8(1.6-1.9)	2.3(2.1-2.4)	0.5(0.4-0.6)	0.5(0.4-0.6)
	2013	2.4(2.2-2.7)	9.2(8.6-9.7)	3.5(3.2-3.7)	4.0(3.8-4.3)	1.6(1.5-1.8)	2.1(2.0-2.2)	0.5(0.4-0.6)	0.6(0.5-0.7)
	2014	2.1(1.9-2.4)	8.1(7.6-8.6)	3.3(3.1-3.6)	3.5(3.3-3.8)	1.5(1.4-1.6)	2.1(2.0-2.3)	0.5(0.4-0.6)	0.5(0.4-0.6)
	2015	2.5(2.3-2.8)	8.6(8.1-9.2)	3.3(3.1-3.6)	4.1(3.9-4.4)	1.6(1.5-1.7)	2.0(1.8-2.1)	0.4(0.3-0.5)	0.5(0.4-0.6)
	2016	2.4(2.1-2.7)	7.7(7.2-8.2)	3.2(3.0-3.5)	4.0(3.7-4.3)	1.6(1.5-1.7)	2.1(2.0-2.2)	0.4(0.4-0.5)	0.5(0.4-0.6)
	2017	2.8(2.6-3.2)	8.4(7.8-8.9)	3.7(3.5-3.9)	4.4(4.2-4.7)	1.7(1.6-1.8)	2.0(1.8-2.1)	0.6(0.5-0.7)	0.5(0.5-0.6)
	2018	2.6(2.3-2.9)	8.7(8.1-9.2)	3.9(3.6-4.1)	4.7(4.4-5.0)	1.7(1.6-1.8)	2.1(2.0-2.2)	0.4(0.3-0.5)	0.7(0.6-0.8)
	2019	2.6(2.4-2.9)	8.4(7.9-9.0)	4.3(4.0-4.6)	5.2(4.9-5.5)	2.0(1.9-2.1)	2.3(2.2-2.5)	0.6(0.5-0.7)	0.6(0.5-0.7)
	2020	2.5(2.3-2.8)	8.3(7.8-8.8)	4.0(3.7-4.2)	4.8(4.5-5.1)	1.8(1.7-1.9)	2.0(1.9-2.2)	0.4(0.4-0.5)	0.7(0.6-0.8)
	2021	2.5(2.3-2.8)	11.3(10.7-11.9)	3.2(3.0-3.5)	4.4(4.2-4.7)	1.6(1.5-1.7)	1.9(1.8-2.0)	0.6(0.5-0.7)	0.6(0.5-0.7)

Supplementary Table 3 Incidence rate of Self-harm from 2012-2021, stratified by sex and age-group in Emergency Department.

		Emergency Department stratified by Sex and Age Group							
		10 – 18 Year old		19 – 34 Year old		35 – 64 Year old		65+ Year Old	
		Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)	Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)	Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)	Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)
Year	2012	2.4(2.2-2.7)	4.0(3.7-4.4)	4.1(3.8-4.3)	3.2(3.0-3.5)	1.5(1.4-1.6)	1.9(1.7-2.0)	0.7(0.6-0.8)	0.7(0.6-0.8)
	2013	2.5(2.2-2.8)	4.6(4.2-5.0)	3.6(3.4-3.8)	3.2(3.0-3.5)	1.5(1.4-1.6)	1.7(1.6-1.8)	0.7(0.6-0.8)	0.6(0.5-0.7)
	2014	2.4(2.1-2.6)	4.3(3.9-4.7)	3.7(3.5-3.9)	3.1(2.8-3.3)	1.5(1.3-1.6)	1.8(1.7-1.9)	0.8(0.7-1.0)	0.8(0.7-0.9)
	2015	3.0(2.7-3.4)	5.4(4.9-5.8)	3.5(3.3-3.8)	3.3(3.1-3.5)	1.6(1.5-1.7)	1.7(1.6-1.9)	0.7(0.6-0.9)	0.6(0.5-0.7)
	2016	2.3(2.0-2.6)	4.9(4.5-5.3)	3.6(3.4-3.8)	3.2(3.0-3.5)	1.6(1.5-1.8)	1.8(1.7-1.9)	0.8(0.7-0.9)	0.7(0.6-0.8)
	2017	2.4(2.2-2.7)	5.2(4.8-5.6)	3.9(3.6-4.1)	3.6(3.4-3.9)	1.7(1.6-1.8)	1.7(1.6-1.8)	0.9(0.8-1.1)	0.8(0.7-0.9)
	2018	2.6(2.4-2.9)	5.4(5.0-5.9)	4.1(3.9-4.4)	3.7(3.4-3.9)	1.6(1.5-1.7)	1.7(1.6-1.9)	1.0(0.9-1.2)	0.9(0.7-1.0)
	2019	2.5(2.2-2.8)	5.1(4.7-5.5)	4.1(3.9-4.4)	4.0(3.7-4.2)	1.7(1.6-1.8)	1.8(1.7-1.9)	0.9(0.8-1.1)	0.7(0.6-0.8)
	2020	1.8(1.6-2.1)	4.6(4.2-5.0)	3.5(3.3-3.8)	3.5(3.2-3.7)	1.5(1.4-1.6)	1.5(1.3-1.6)	0.6(0.5-0.7)	0.6(0.5-0.7)
	2021	1.3(1.1-1.5)	5.1(4.7-5.5)	2.7(2.5-2.9)	2.6(2.4-2.8)	1.0(1.0-1.1)	1.1(1.0-1.2)	0.3(0.3-0.4)	0.3(0.3-0.4)

Supplementary Table 4 Incidence rate of Self-harm from 2012-2021, stratified by sex and age-group in Hospital Admissions.

		Hospital Admissions stratified by Sex and Age Group							
		10 – 18 Year old		19 – 34 Year old		35 – 64 Year old		65+ Year Old	
		Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)	Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)	Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)	Male Incidence Rate (95% CI)	Female Incidence Rate (95% CI)
Year	2012	1.1(0.9-1.3)	4.0(3.6-4.3)	2.0(1.8-2.2)	2.1(1.9-2.3)	1.1(1.0-1.2)	1.4(1.3-1.5)	0.4(0.3-0.4)	0.3(0.3-0.4)
	2013	1.3(1.1-1.5)	5.4(5.0-5.8)	2.0(1.9-2.2)	2.2(2.0-2.4)	1.1(1.0-1.2)	1.4(1.3-1.6)	0.4(0.3-0.5)	0.4(0.3-0.5)
	2014	1.1(0.9-1.3)	5.1(4.7-5.5)	1.9(1.7-2.1)	2.0(1.8-2.2)	1.0(1.0-1.1)	1.4(1.3-1.5)	0.3(0.2-0.4)	0.3(0.3-0.4)
	2015	1.4(1.2-1.6)	5.6(5.2-6.1)	1.7(1.5-1.9)	2.0(1.8-2.2)	0.9(0.8-1.0)	1.2(1.1-1.3)	0.4(0.3-0.5)	0.4(0.3-0.5)
	2016	1.2(1.0-1.4)	4.7(4.3-5.1)	1.7(1.5-1.9)	2.0(1.9-2.2)	1.0(0.9-1.1)	1.2(1.1-1.3)	0.4(0.3-0.4)	0.4(0.3-0.5)
	2017	1.2(1.0-1.4)	5.2(4.8-5.7)	2.0(1.8-2.2)	2.2(2.0-2.4)	1.0(1.0-1.1)	1.2(1.1-1.3)	0.3(0.3-0.4)	0.4(0.3-0.5)
	2018	1.2(1.0-1.4)	4.8(4.4-5.2)	2.0(1.8-2.2)	2.1(2.0-2.3)	1.0(0.9-1.1)	1.2(1.1-1.3)	0.4(0.3-0.5)	0.5(0.4-0.5)
	2019	1.3(1.1-1.5)	4.8(4.4-5.2)	1.9(1.7-2.1)	2.2(2.0-2.4)	0.9(0.8-1.0)	1.2(1.1-1.3)	0.3(0.3-0.4)	0.3(0.3-0.4)
	2020	1.1(0.9-1.3)	5.1(4.7-5.5)	1.6(1.4-1.7)	2.0(1.8-2.1)	0.9(0.8-1.0)	1.0(0.9-1.1)	0.3(0.3-0.4)	0.4(0.3-0.5)
	2021	1.1(0.9-1.3)	6.5(6.1-7.0)	1.1(0.9-1.2)	1.4(1.2-1.6)	0.7(0.6-0.7)	0.8(0.7-0.9)	0.3(0.2-0.4)	0.3(0.3-0.4)

Supplementary Table 5 Presentation of self-harm across settings from 2012-2021

Healthcare setting	Events[b](n)	Events %(95% CI)	Self-poisoning[c]	Self-injury[c]	Self-poisoning and injury[c]	Male	Female	Least Deprived	Most Deprived
GP[d] only	49295	37.3(37.0-37.7)	66.7(66.0-67.5)	9.4(9.2-9.7)	0.5(0.5-0.6)	39.8(39.2-40.4)	62.4(61.7-63.1)	11.9(11.6-12.2)	30.9(30.4-31.4)
ED[e] only	36953	28.8(28.5-29.1)	33.4(32.8-33.9)	14.4(14.0-14.8)	1.0(0.9-1.1)	51.5(50.8-52.3)	53.5(52.7-54.2)	10.6(10.3-10.9)	36.1(35.5-36.7)
Admission only	18957	14.5(14.3-14.7)	83.9(82.6-85.2)	12.6(12.1-13.1)	3.6(3.3-3.8)	41.1(40.2-42.1)	61.9(60.8-63.0)	11.9(11.4-12.4)	32.4(31.6-33.2)
GP and ED	12001	9.0(8.8-9.1)	80.7(79.1-82.3)	6.5(6.1-7.0)	1.4(1.2-1.6)	42.1(40.9-43.3)	58.8(57.4-60.2)	8.7(8.2-9.3)	33.4(32.4-34.5)
GP and Admission	8109	6.1(6.0-6.2)	90.8(88.8-92.9)	6.2(5.7-6.8)	4.5(4.0-4.9)	33.4(32.1-34.7)	68.3(66.6-70.2)	12.5(11.7-13.3)	29.9(28.7-31.1)
ED and Admission	5070	3.8(3.7-3.9)	85.6(83.1-88.2)	11.3(10.4-12.3)	4.4(3.9-5.1)	39.8(38.1-41.6)	62.2(60.1-64.4)	10.0(9.1-10.9)	35.1(33.5-36.8)
GP, ED and Admission	4543	3.4(3.3-3.5)	91.6(88.8-94.4)	4.9(4.3-5.6)	4.7(4.1-5.4)	35.2(33.5-37.0)	66.1(63.7-68.5)	10.1(9.2-11.0)	31.1(29.5-32.8)

a. Mutually exclusive groups
b. Self-harm event defined as a self-harm presentation across one of more services on a given date
c. Recording of methods in EDs represents an underestimate with method of self-harm not identified for >50% of events
d. General practice
e. Emergency Department

Supplementary Table 6 Self-harm related admissions by admission specialty

Admission Specialty	Events(n)	%(95 CI) of admissions	Average(SD) Los[b]
Mental Health	680	1.8(1.7-2.0)	27(79.2)
Paediatrics	6990	18.6(18.2-19.1)	1(5.9)
Injury/poisoning	6785	18.1(17.6-18.5)	0(7.2)
Surgery	1058	2.8(2.6-3.0)	3(9.7)
General Medicine	16395	43.7(43.0-44.3)	2(6.7)
Other/Unknown	5623	15.0(14.6-15.4)	4(12.6)

a. **Admissions with multiple specialities not shown due to small numbers**
b. **Length of Stay**

Supplementary Table 7 Percentage of ED attendances for self-harm with a hospital admission within 7 days stratified by method, age and sex

		All attendances		Self-poisoning only		Self-injury only		Both self-poisoning & self-injury		Unknown method	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Age group	10-16 years	37.2(34.3-40.3)	61.6(59.4-63.9)	56.3(50.2-62.9)	78.6(75.1-82.2)	38.7(34.7-42.9)	46.1(40.8-51.9)	72.0(42.7-113.8)	92.2(74.5-112.8)	27.0(23.4-31.0)	38.6(35.5-41.9)
	17-18 years	25.6(23.1-28.2)	34.3(32.2-36.6)	37.8(33.1-42.9)	45.4(42.0-49.1)	18.0(14.3-22.4)	20.6(15.1-27.4)	60.0(27.4-113.9)	69.0(46.2-99.2)	16.6(13.7-20.0)	21.4(18.8-24.3)
	19-24 years	27.3(25.9-28.8)	28.3(26.9-29.8)	38.3(35.8-40.8)	37.4(35.1-39.7)	18.4(16.1-21.0)	16.2(12.9-20.1)	43.2(30.6-59.3)	60.0(45.1-78.3)	16.5(14.8-18.4)	17.7(16.0-19.7)
	25-34 years	31.8(30.5-33.2)	35.9(34.5-37.4)	42.1(39.9-44.3)	46.5(44.2-48.8)	23.2(20.7-25.9)	19.9(16.5-23.7)	50.0(38.7-63.5)	62.0(47.5-79.5)	20.8(19.2-22.5)	24.6(22.7-26.6)
	35-44 years	37.7(36.0-39.4)	39.0(37.3-40.7)	48.6(45.8-51.4)	50.2(47.6-52.9)	26.4(23.2-30.0)	21.4(17.2-26.5)	51.1(37.4-68.2)	64.1(47.6-84.5)	26.0(23.9-28.3)	26.1(24.0-28.5)
	45-54 years	41.3(39.2-43.4)	43.0(41.1-45.0)	52.1(48.8-55.6)	52.7(49.9-55.5)	28.3(24.3-32.7)	26.4(20.6-33.2)	63.3(43.0-89.8)	64.8(45.1-90.1)	29.3(26.5-32.4)	28.5(25.9-31.4)
	55-64 years	44.4(41.2-47.7)	44.7(41.8-47.8)	53.8(49.0-59.0)	54.2(50.0-58.7)	25.4(20.2-31.4)	18.3(12.0-26.8)	58.1(34.4-91.8)	66.7(39.5-105.4)	34.0(29.4-39.1)	31.8(27.5-36.7)
	65-74 years	45.3(40.8-50.0)	48.2(43.7-53.0)	54.3(47.7-61.5)	55.7(49.6-62.3)	18.4(13.6-24.3)	15.8(9.5-24.7)	50.0(20.1-103.0)	53.3(23.0-105.1)	43.1(35.2-52.3)	46.6(37.5-57.3)
	75+	42.3(38.6-46.3)	43.3(39.6-47.2)	61.0(54.5-68.0)	56.0(50.2-62.3)	15.6(13.0-18.5)	15.8(12.1-20.4)	81.8(37.4-155.3)	75.0(34.3-142.4)	52.0(41.1-65.0)	57.5(46.6-70.2)
Total		**34.8(34.1-35.5)**	**40.6(39.9-41.3)**	**46.4(45.2-47.6)**	**46.4(45.2-47.6)**	**24.0(22.8-25.1)**	**23.8(22.3-25.5)**	**23.9(23.0-24.8)**	**23.9(23.0-24.8)**	**23.9(23.0-24.8)**	**23.9(23.0-24.8)**

Supplementary Table 8 Outpatient appointment and DNAa's within 30 days of a self-harm event by consultant specialtyb

	Events (n)	Appointments (%(95% CI))	DNA ((%(95% CI))
Other/Unknown	12517	28.8(28.8-28.8)	36.8(36.8-36.9)
Mental Health	26783	61.6(61.6-61.6)	23.1(23.1-23.1)
Paediatrics	437	1.0(1.0-1.0)	20.8(20.7-21.0)
Injury/poisoning	26	0.1(0.1-0.1)	23.1(21.8-25.7)
Surgery	2067	4.8(4.8-4.8)	40.2(40.2-40.2)
General Medicine	670	1.5(1.5-1.5)	43.1(43.1-43.2)
Total	43460		

a. Did Not Attend

b. Not mutually exclusive groups; 960 events have outpatient appointments under multiple specialities within 30 days

Supplementary Table 9 Number of events, (95% CI) of outpatient appointments and proportion marked as DNA(did not attend) by demographic variables

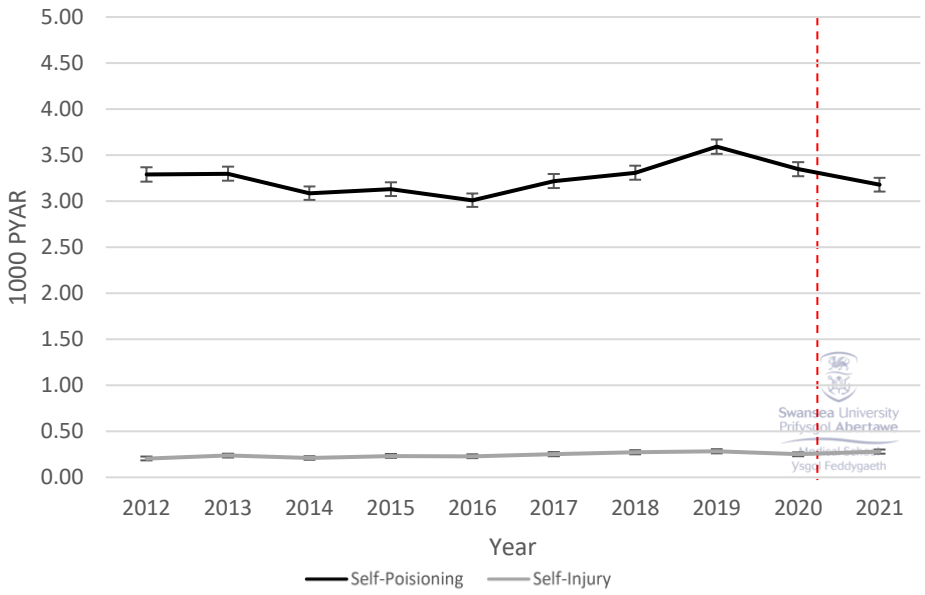
		All			Male			Female		
		Self-harm events	Outpatients [a]	DNA[b]	Self-harm events	Outpatients	DNA	Self-harm events	Outpatients	DNA
Age group	10-16 years	8143	42.4(41.5-43.4)	25.7(24.6-26.8)	1602	41.8(39.8-43.9)	25.7(23.2-28.3)	6541	42.6(41.5-43.6)	25.7(24.4-26.9)
	17-18 years	3243	34.0(32.8-35.2)	26.9(25.2-28.8)	906	30.0(28.0-32.0)	27.8(24.5-31.5)	2337	35.8(34.4-37.3)	26.6(24.5-28.7)
	19-24 years	5460	23.9(23.3-24.6)	27.6(26.2-29.0)	2403	23.8(22.8-24.7)	30.0(27.9-32.3)	3057	24.0(23.2-24.9)	25.7(24.0-27.6)
	25-34 years	7987	27.9(27.3-28.5)	32.0(30.8-33.3)	3503	24.4(23.6-25.2)	33.9(32.0-35.9)	4484	31.4(30.5-32.4)	30.6(29.0-32.2)
	35-44 years	6703	29.3(28.6-30.0)	30.6(29.3-31.9)	3136	28.6(27.6-29.7)	33.3(31.3-35.4)	3567	29.9(28.9-30.9)	28.2(26.5-30.0)
	45-54 years	5884	31.0(30.2-31.8)	30.3(28.9-31.8)	2400	29.8(28.6-31.0)	30.9(28.7-33.2)	3484	31.9(30.9-33.0)	30.0(28.2-31.8)
	55-64 years	2913	33.7(32.5-34.9)	28.6(26.7-30.6)	1214	31.5(29.7-33.3)	29.2(26.3-32.4)	1699	35.5(33.8-37.2)	28.1(25.7-30.8)
	65-74 years	1476	38.1(36.1-40.1)	26.0(23.5-28.8)	642	37.3(34.5-40.4)	25.2(21.5-29.4)	834	38.6(36.1-41.3)	26.6(23.2-30.4)
	75+	1651	38.7(36.8-40.6)	25.9(23.5-28.4)	804	41.4(38.6-44.4)	24.9(21.5-28.6)	847	36.4(34.0-38.9)	26.8(23.4-30.5)
Deprivation	Least	4757	31.6(30.7-32.5)	25.0(23.6-26.5)	1552	28.5(27.1-29.9)	26.2(23.7-28.9)	3205	33.4(32.2-34.5)	24.5(22.8-26.2)
	4	5093	30.1(29.3-30.9)	28.3(26.9-29.8)	1827	27.7(26.4-29.0)	30.5(28.1-33.2)	3266	31.7(30.6-32.8)	27.0(25.3-28.9)
	3	7066	30.3(29.6-31.0)	26.8(25.6-28.0)	2681	28.2(27.1-29.3)	29.2(27.2-31.3)	4385	31.7(30.8-32.7)	25.3(23.8-26.8)
	2	10948	33.2(32.6-33.9)	28.7(27.7-29.7)	4307	30.9(30.0-31.8)	30.8(29.2-32.5)	6641	34.9(34.1-35.8)	27.3(26.0-28.6)

	Most	13741	31.0(30.5-31.5)	31.3(30.4-32.2)	5486	28.0(27.3-28.7)	32.5(31.0-34.1)	8255	33.4(32.6-34.1)	30.5(29.3-31.7)
All		**43460**	**32.2(31.9-32.5)**	**28.8(28.3-29.3)**	**16610**	**28.7(28.3-29.2)**	**30.6(29.7-31.4)**	**26850**	**33.1(32.8-33.5)**	**27.7(27.1-28.3)**

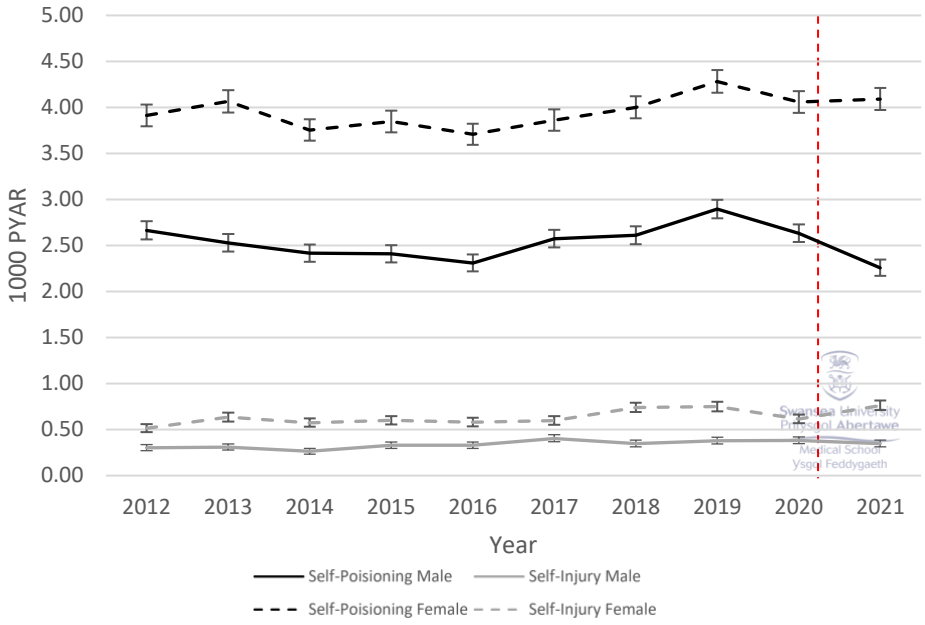
a. Proportion of self-harm events with an outpatients appointment within 30 days

b. Proportion of individuals with an outpatient appointment recorded with a 'Did Not Attend' or 'DNA' recorded

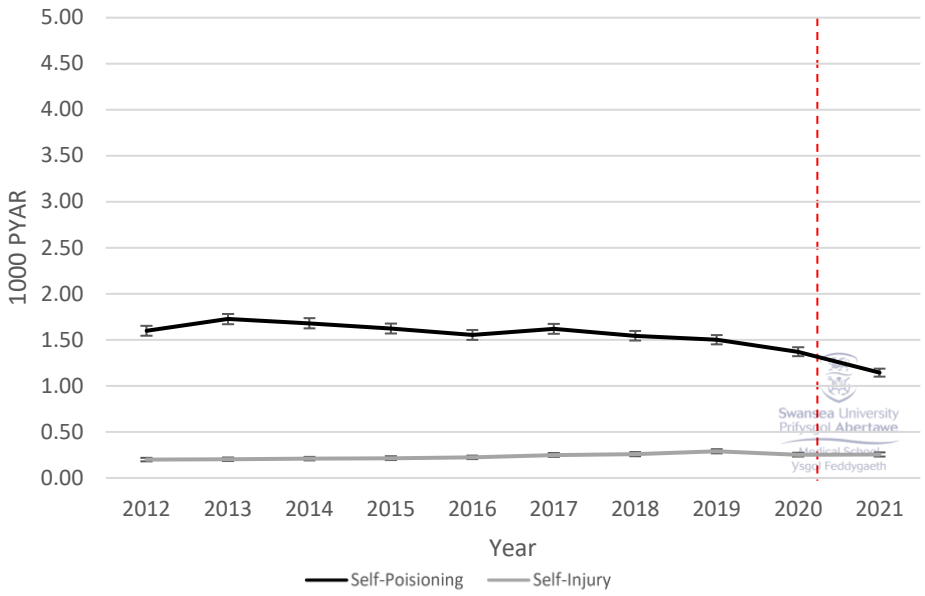
Supplementary Figures



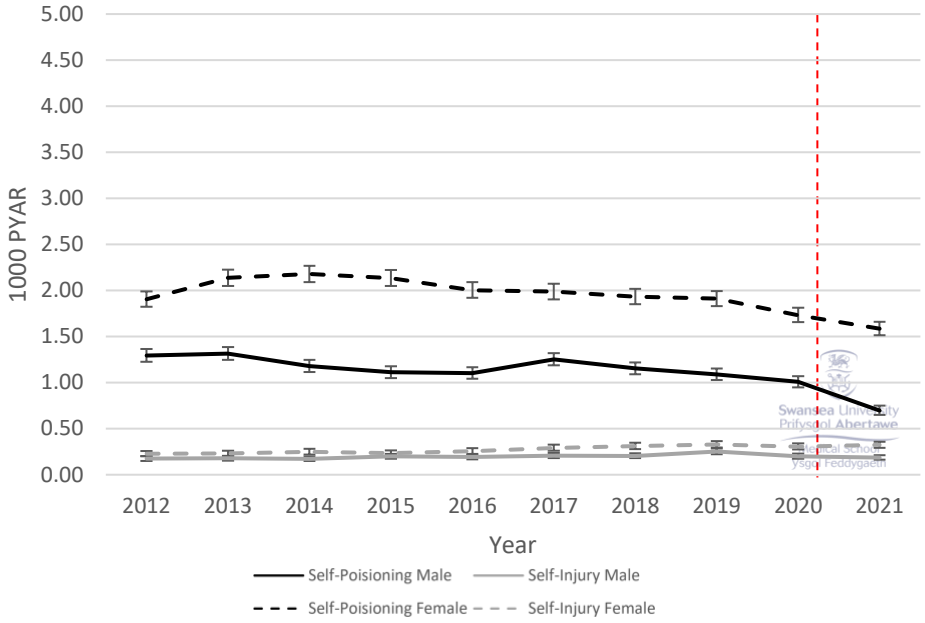
Supplementary Figure 1 Incidence of Self-harm overtime stratified by method in GP



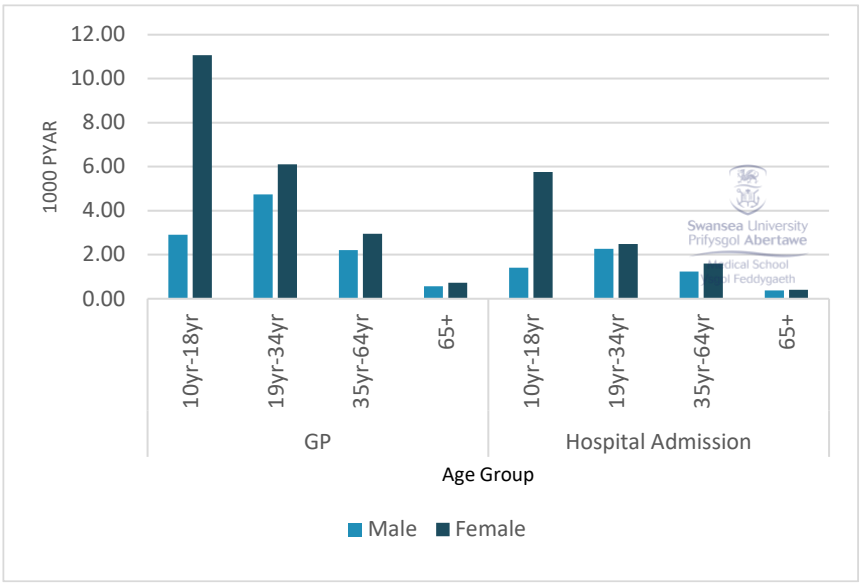
Supplementary Figure 2 Incidence of Self-harm overtime stratified by method and sex in GP



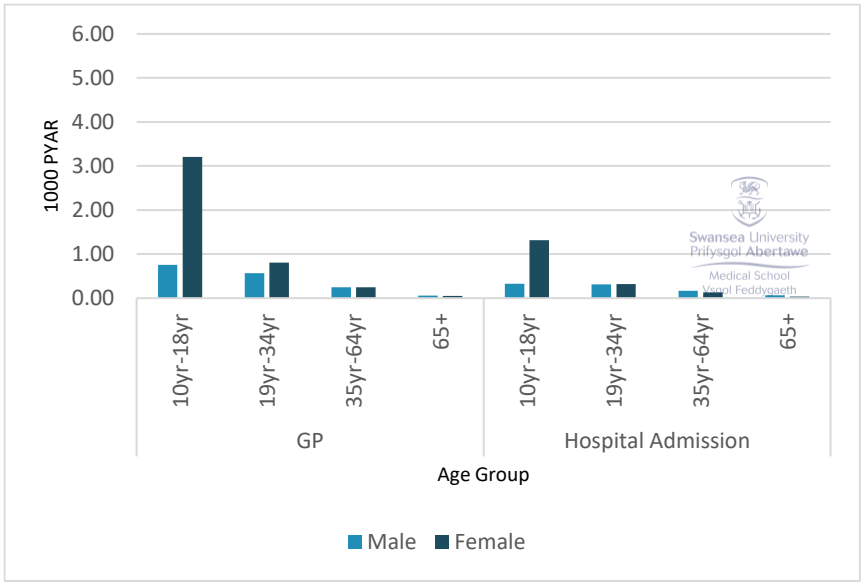
Supplementary Figure 3 Incidence of Self-harm overtime stratified by method in Hospital Admission



Supplementary Figure 4 Incidence of Self-harm overtime stratified by method and sex in Hospital Admission



Supplementary Figure 5 Incidence of Self-poisoning stratified by age group and healthcare settings



Supplementary Figure 6 Incidence of Self-injury stratified by age group and healthcare settings