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Investigation of severe infections amongst people who inject drugs

Agencies involved in collecting data:

Public Health Wales including Health Protection, Microbiology and Infectious Disease Specialists

Health Boards in Wales - Directors of Public Health, Medical Directors, surgical teams, emergency departments and intensive care

Substance misuse services in Wales

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Purpose and Summary of Document:

A cluster of severe infections amongst PWID resulting in radical surgical intervention and/or ITU was identified in Wales during an 18 month period November 2017 to April 2019. This report describes the investigation that followed. Recommendations are presented for the consideration of and implementation by relevant services.

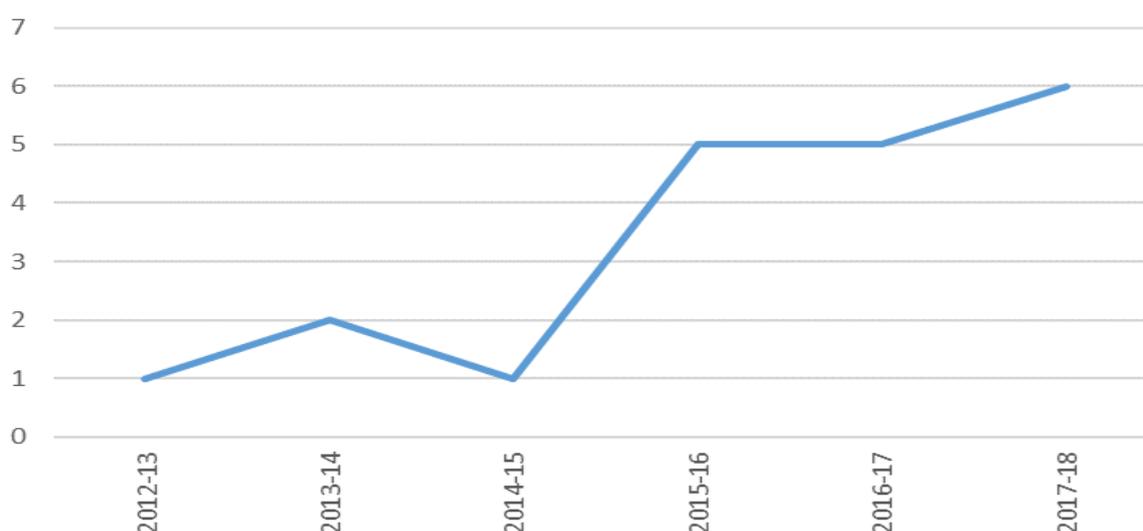
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1 Background

On 1st February 2018, Public Health Wales were notified by microbiology and surgical consultants in Morriston Hospital, Abertawe Bro Morgannwg University Health Board (ABMU) of several cases of severe infections in people who inject drugs (PWID) resulting in radical surgical intervention to limbs. Of seven cases undergoing surgery, four patients had required hip disarticulation (complete removal of the lower limb at the hip joint) since 3rd November 2017. Further cases requiring intensive care admission (ITU) were also reported. All cases were resident in the ABMU area. Microbiology specimens demonstrated a variety of different organisms with no common species identified

Public Health Wales Health Protection division investigated the background incidence of this hip disarticulation in Wales using PEDW data for principal procedure code (OPCS4) X092: Amputation of leg, Disarticulation of hip (figure 1). This data indicated unusual numbers of recent severe infections amongst PWID in ABMU warranting further investigation as indicated in Table 1.



Source: PEDW 2019

Figure 1: Number of finished consultant episodes for X092: Amputation of leg; Disarticulation of hip in Wales 2012-13 to 2017-18

Table 1: Demographic data of patients undergoing amputation of leg, Disarticulation of hip (ICD10: X092 in Wales 2012-2018

Finished Consultant Episodes, PEDW online data	All	Male	Female	Age 0-14	Age 15-59	Age 60-74	Age75+	Proportion male
Total 2012-2018	20	12	8	1	10	7	2	60%
Mean 2012-2018	3	2	1.3	0.2	1.7	1.2	0.3	60%
PEDW 2017-2018	6	3	3	0	5	1	0	50%
Surgeon reports, Morriston, Nov 2017 - Feb 2018	4	2	2	0	4	0	0	50%

Initial investigation through interrogation of patient case notes and clinical records was undertaken by Bethan Bowden and Laia Fina reporting on a cluster of nine cases, plus one patient deceased. The report was published on 17th May 2018. Main findings, incorporated within this report, identified:

- Nine cases of severe infections identified in people who inject drugs (PWID), specifically groin injectors in the Swansea and Neath Port Talbot areas, from November 2017 to April 2018.
- Most had muscle or groin infections such as psoas abscesses, myositis, necrotising fasciitis, or femoral pseudoaneurysms. 2/9 had infective endocarditis, 1/9 had a cavitating pneumonia.
- All required ITU admission; 7/9 required surgical intervention: 4/9 had a hip disarticulation procedure – the annual number of these procedures across Wales for the period 2012-2017 was between 1-5 cases, with a mean of 2.8 cases per year. The cases were younger and more likely to be female than those undergoing this procedure in recent years.
- No common species was identified with a range of gram positive and gram negative organisms detected

Control measures

In addition to ensuring appropriate follow up with each of the initial nine cases identified, it was agreed that an IMT be established and that the following control measures would be appropriate:

- Enhanced surveillance of all cases meeting the revised case definition from the seven health board areas in Wales identified since 1st January 2018. Microbiological details including bacteria or fungi isolated from a normally sterile site (joint, blood) or abscess and bacteria or fungi cultured from any site from a case would be recorded in any new cases identified.
- Investigation of the potential contamination of heroin and other drugs being injected by cases and circulating in the area.
- Investigation of any recent changes in the drugs market (types of, or availability of, drugs associated with subsequent infections warranting surgical intervention or ITU admission)
- Development of a communications plan to include a targeted awareness raising campaign aimed at PWID, specifically highlighting the additional risks of groin injecting.

Following completion of the initial investigation and circulation of the report, it was agreed that an Incident Management Team be established and enhanced surveillance covering all seven health board areas in Wales be undertaken. A briefing was issued on 25th May 2018 (see Appendix A). The first meeting of the IMT was held on Monday 18th June 2018. It was agreed by the IMT that enhanced surveillance was required both on the existing nine cases retrospectively and for new patients presenting to 1st November 2018. This period was subsequently extended to cover the period 1st November 2018 to 1st April 2019.

2 Case definition

Following the IMT, the revised agreed case definition for the enhanced surveillance investigation was:

A patient known to be a person who injects drugs (PWID) with evidence of infection – by isolation of bacteria or fungi isolated from a normally sterile site or abscess, or imaging / similar evidence of infection - necessitating surgical intervention or ITU/HDU admission between 1st November 2017 and 1st April 2019.

A probable case had imaging evidence of infection and a severe presentation (ITU/HDU or surgery) but without a microbiological isolate.

3 Population at risk

Persons who inject drugs and are resident in Wales

4 Case ascertainment and in-depth interviews

Patient case-note review:

Clinical teams at the Morriston Hospital including A+E, ITU, Orthopaedics, Burns and Plastics, Vascular Surgery and Microbiology were contacted by email by the medical director for ABMUHB requesting that any cases meeting the above case definition were reported to the Health Protection Team.

ICU consultant colleagues were contacted and a hand search of the ITU database was performed to identify patients admitted from November 2017 to April 2018 who were PWID. This identified 10 patients, of which 4 were the cases already reported by the surgical teams. The remaining 6 cases were reviewed for an admission that included a diagnosis of infection in keeping with the case definition. Three cases were discarded as they were admitted with drug overdoses, the three remaining cases were identified as possible cases.

The ABMUHB nurse for vulnerable groups was contacted to identify any possible cases within her caseload. 5 individuals were identified as PWID who had recent admission to hospital. One of these individuals had been already identified from the ITU case ascertainment.

Medical notes for all cases were reviewed either on the ward at Morriston Hospital if they remained as in-patients or within health records if they had been discharged or were deceased.

Enhanced surveillance:

Following on from the initial patient case-note investigation and in line with the IMT briefing in June 2018, each Health Board was requested to report each new case meeting the agreed definition to the Health Protection Team who would record on the Tarian system. Health Protections teams would then notify the Substance Misuse team of a new case requiring further investigation. The Health Protection team was asked to provide the following details for each case:

- Patient contact details
- Date of birth
- Hospital admission details

- Date of diagnosis
- Vital status
- Microbiological details
- Further details on clinical presentation

In addition, it was requested that the clinical team involved with care confirm that the patient met the case definition:

CHECKLIST - (if yes to all questions appropriate to continue):

Person who injects drugs?	Yes		No	
Bacteria or fungi have been isolated from a normally sterile site (joint, blood) or abscess OR imaging or similar evidence of infection?	Yes		No	
Patient required surgical intervention OR Patient admitted to ITU/HDU	Yes		No	

Once notified to the Substance Misuse Team, a letter (Appendix B) was issued to the contact address containing a contact telephone number to arrange an interview. If no contact was made, further attempts were made to contact the case by telephone and home visit/outreach.

Following contact with patients, field investigation was undertaken by the substance misuse programme team due to experience working with people who inject drugs. An enhanced surveillance form was developed, adapted from an existing validated tool, within Health Protection covering specific details in relation to injecting drug use, recent changes in drug use behaviour and other risk factors, alongside the clinical data. A copy of the Enhanced Surveillance Form is provided as Appendix C.

5 Descriptive epidemiology

Following expansion of investigation across Wales from June 2018 to April 2019, a total of 46 individuals were identified, including the nine cases previously reviewed during the defined period. Seven were discarded as they did not meet the case definition: 2/7 were not PWID, 5/7 had evidence of staphylococcal infections infection but did not meet case definition as either no surgical intervention or ITU admission. A further four had insufficient details at notification or subsequently to establish if the case definition could be met, resulting in a final count of 35 cases within period, of which two are now deceased, one prior to enhanced surveillance and one subsequently. 15 cases did not have a Tarian case reference.

34 cases were contacted for interview. 15 patients were interviewed and 18 were lost to follow up, representing a 44 per cent follow up rate. Of the 15 interviewed, eight had a Tarian case number. Of the original nine cases reviewed: three were interviewed, six were lost to follow up and one patient died.

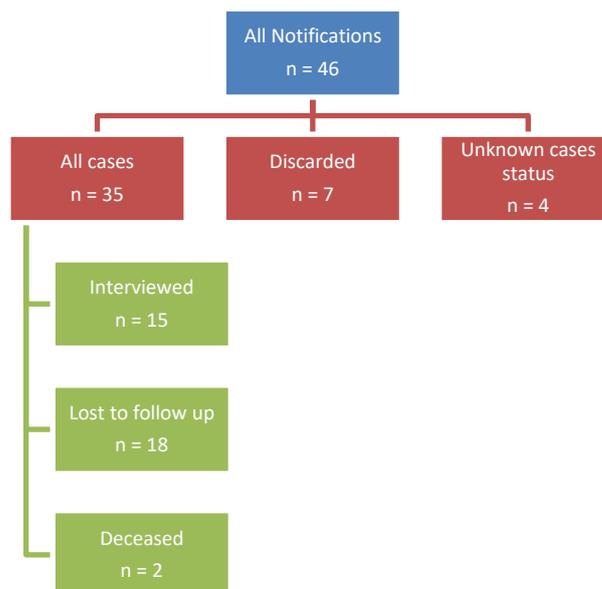


Figure 2: Summary of case investigation of severe infections amongst PWID in Wales

5.1 Demographics of all cases

Of the 35 original cases, 19 were male. The median age was 38 (range 23 to 57 years). All cases were resident in Wales with the majority, 54 per cent, resident within the ABMUHB area as shown in Table 2. All self-reported as persons who inject drugs and a recent history of injecting into groin. Age and sex profile is provided in Figure 3. The most frequent age group was 35-39 years.

Data from the Harm Reduction Database indicates that the sex ratio of current and regular PWID accessing NSP is around 70:30 male to female and is consistent with other data sources including UAM and treatment data. There is a greater proportion of females represented within this case cohort with ratio of 55:45 male to female.

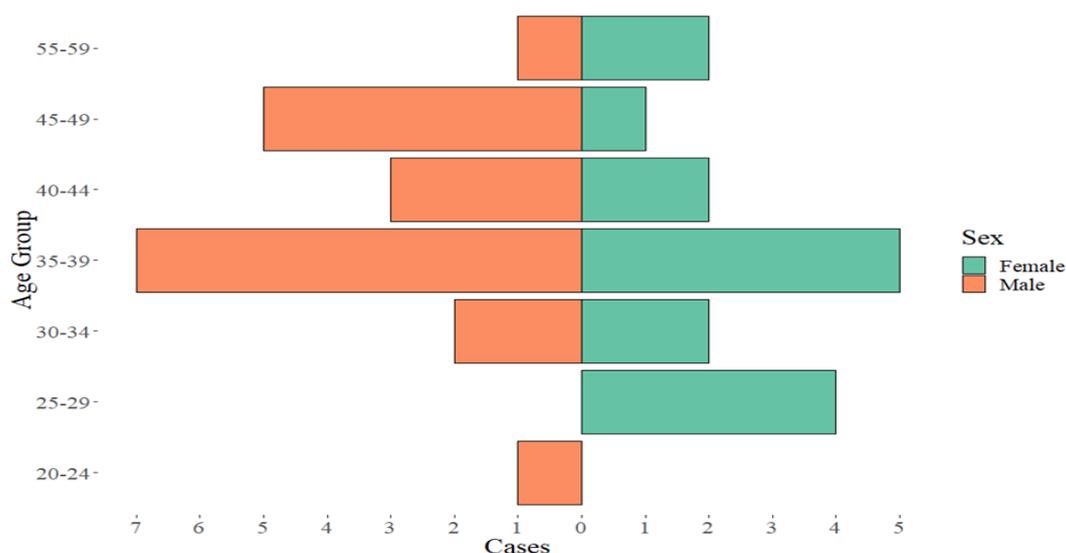


Figure 3: Age and sex profile of cases

Table 2: Basic demographic details of cases including housing status by local authority area in Wales

Demographics				
Total number of cases	35			
Male	19 (54%)			
Median age (range) in years	38 (23 to 57)			
Risk factors				
People who inject drugs	35			
Self-report of injecting into groin	35			
Local Authority and Health Board area of residence		Homeless/ unstably housed	Housed	Not Known
Neath Port Talbot	9	2	4	3
Swansea	10	3	4	3
Bridgend	0			
ABMU Health Board	19	5	8	6
Torfaen	2	1	1	
Blaenau Gwent	1		1	
ABU Health Board	3	1	2	
Anglesey	2	1	1	
Denbighshire	1	1		
Gwynedd	1		1	
Wrexham	3	1	2	
BCU health board	7	3	4	
Cardiff	1	1		
Cardiff & Vale University Health Board	1	1		
Merthyr Tydfil	1		1	
RCT	1		1	
Cwm Taf University Health Board	2		2	
Carmarthenshire	1		1	
Hywel Dda University Health Board	1		1	
Powys Teaching Health Board	0			
Unknown	2			2
Total	35	10 (28.6%)	17 (48.6%)	8 (22.8%)

Where known, 10 (28.6 per cent) were confirmed as either homeless/no fixed address or unstably housed in a hostel. Lack of availability of access to sterile equipment storage or injecting in public places increases the risk of infection through use of non-sterile water, lack of personal hygiene, rushing to inject before being seen leading to miss hits.

6 Clinical presentation of cases

The majority of cases, 19 of 35 (54 per cent) were admitted to Morriston Hospital, Swansea throughout the investigation period as shown in Table 3.

Table 3: Number of cases receiving care by named hospital in Wales

Admitting hospital	n	Admitting hospital	n
Morrison	19	UHW Cardiff	1
Neville Hall	2	Wrexham Maelor	3
Prince Charles	1	Ysbyty Glan Clwyd	1
Royal Glamorgan	1	Ysbyty Gwynedd	3
Royal Gwent	1	Unknown	3

6.1 Onset and presenting symptoms

Where recorded, the onset of symptoms ranged from October 2017 to February 2019 with admission dates to hospital ranging from November 2017 to April 2019. All cases were septic on arrival at hospital demonstrating invasive infection but their presenting complaints varied (Table 4).

Table 4: Clinical presentation of cases

Diagnosis on presentation	N
No clinical details available	9
Groin abscess /Staphylococcus aureus infection	8
IGAS	4
Staphylococcal infection	3
Endocarditis	2
Cavitating Pneumonia and Endocarditis	1
Groin abscess / Group C streptococcus	1
Infected groin pseudoaneurysm	1
Infected Haematoma	1
Necrotising fasciitis	1
Necrotising myositis	1
Osteomyelitis, septic	1
Psoas abscess, infective endocarditis	1
Psoas abscess and iliac artery repair	1
purulent myonecrosis, septic	1
Septicaemia	1
Streptococcus pyogenes	1

*more than one complaint could be reported

6.2 Prior admissions for injecting site infections

Detailed data on admissions within six months prior to investigation period are only available for those identified through patient case-notes on ABMU cases: 5 of the 9 cases (56%) had admissions to Morrison hospital in the preceding 6 months for infection associated with injecting sites including cellulitis (n=2) and abscess (n=3). Invalidated data from interviews as part of enhanced surveillance indicated that of the 15 cases interviewed, 10 cases reported injecting site infections in the three months prior to admission with severe infection. Table 5 indicates self-reported injecting site infections and resultant actions. As indicated, three cases did not seek medical attention, with

attempts to self-treat; five cases contacted GP. All cases were admitted to hospital with severe infections within three months.

Table 5: Details of injecting site infections and resultant action within three months of hospitalisation amongst cases

Symptoms / Infection details	Resulting action
Dead leg, 'trapped nerve'	Contacted GP via phone and prescribed codeine
A&E informed 'aneurysm'	Attended A&E and prescribed antibiotics and discharged
Abscess in left groin	Attended GP and prescribed antibiotics
Right groin abscess	Attended GP and prescribed antibiotic
Abscess in right groin	Self-treated
Left groin abscess and bleed	Self-treated
Right leg pain shooting, numbness and hotness	Two weeks after onset collapsed, ambulance and hospitalised /induced coma
Groin abscess	Attend GP receive antibiotics
Infection in groin	Attended A&E
Swelling of whole right leg	Attended GP

7 Hospital admission and surgical interventions

19 cases were reported as undergoing surgical intervention, specified in Table 6. For 16 cases there is no surgical intervention details recorded.

Table 6: Summary of surgical interventions

Hospital intervention	n (%)
Amputation of left fore foot	1
Aspiration of pus	1
Debridement	1
Drainage of psoas abscess	1
Drainage of psoas abscess, operation on aneurysms of iliac artery	1
Hip disarticulation	4
Incision and drainage	2
Incision and drainage of groin	3
Infected groin pseudoaneurysm	1
Knee washout	1
Left Knee amputation	1
Tricuspid valve replacement	1
Valve Replacement	1
No details available	16
Total	35

8 Microbiology results

Samples were sent from multiple sites for the cases including blood cultures, surgical sites, abscess fluid and sputum. No common species was identified with a range of gram positive and gram negative organisms detected (Table 7). All patients were admitted with sepsis and as part of the sepsis pathway broad spectrum antibiotics were administered rapidly following admission. This may have affected the sensitivity of microbiological investigations.

Table 7: Microbiology results of the nine cases reviewed using patient case notes

ID	Onset of symptoms	Admission	Diagnosis	Sepsis	Date of culture	Sample site	Microbiological results
1	26.12.17	27.12.17	Infected groin pseudoaneurysm	Yes	28.12.17	Tissue at time of surgery	Staph lugdunensis, Staph epidermidis & mixed anaerobes
14	28.10.17	03.11.17	Osteomyelitis	Yes	04.11.17	Blood culture	Staph aureus
21	07.01.18	10.01.18	Necrotising myositis	Yes	Nil reported		
13	25.01.18	27.01.18	Necrotising myositis	Yes	28.01.18		Dialister Pneumosintes, gram pos cocci, gram neg bacilli, gram neg coccobacillus, mixed anaerobes
31	26.11.17	30.11.17	Psoas abscess and iliac artery rupture	Yes	30.11.17	Pus from abscess	Gram positive cocci
10	03.01.18	17.01.18	Cavitating pneumonia	Yes	17.01.18	Blood culture	Gram negative cocci
24		19.10.2017	Infective endocarditis		Multiple	Blood culture	All negative
3	01.04.18	02.04.18	Psoas abscess and infective endocarditis	Yes	03.04.18	Blood culture	MSSA Group B strep
26		19.04.18	Necrotising fasciitis	Yes	23.04.18	Tissue at time of surgery	Helococcus sp. Prevotella timonensis, Peptoniphilus, Porphyromonas

The time between onset and admission ranged from 1 to 14 days (recorded in 7/9 cases), with a median interval of 3 days.

9 ITU admission

Of the initial nine ABMU cases reviewed, all required ITU admission. The onset of admission to ITU ranged from 4th November 2017 to 23rd April 2018 (Figure 4), demonstrating some time-clustering of ITU admissions in PWID in late 2017 and early 2018.

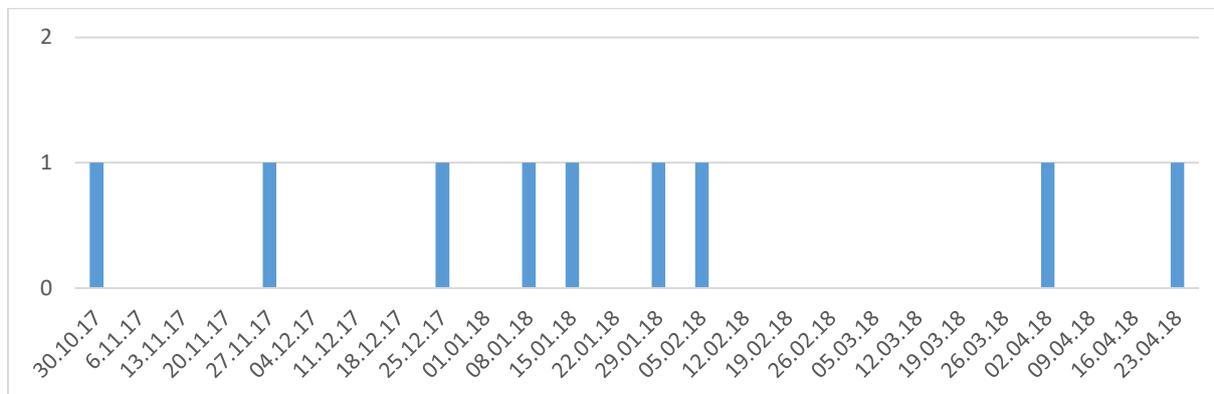


Figure 4: Onset of ITU admission in initial nine ABMU cases reviewed

For the 35 cases, data of hospital admission is available for 15 cases of which 13 were admitted to ITU. No ITU data was recorded for the remaining 22 cases. Figure 5 shows the cases by month of hospital admission (or notification), by status.

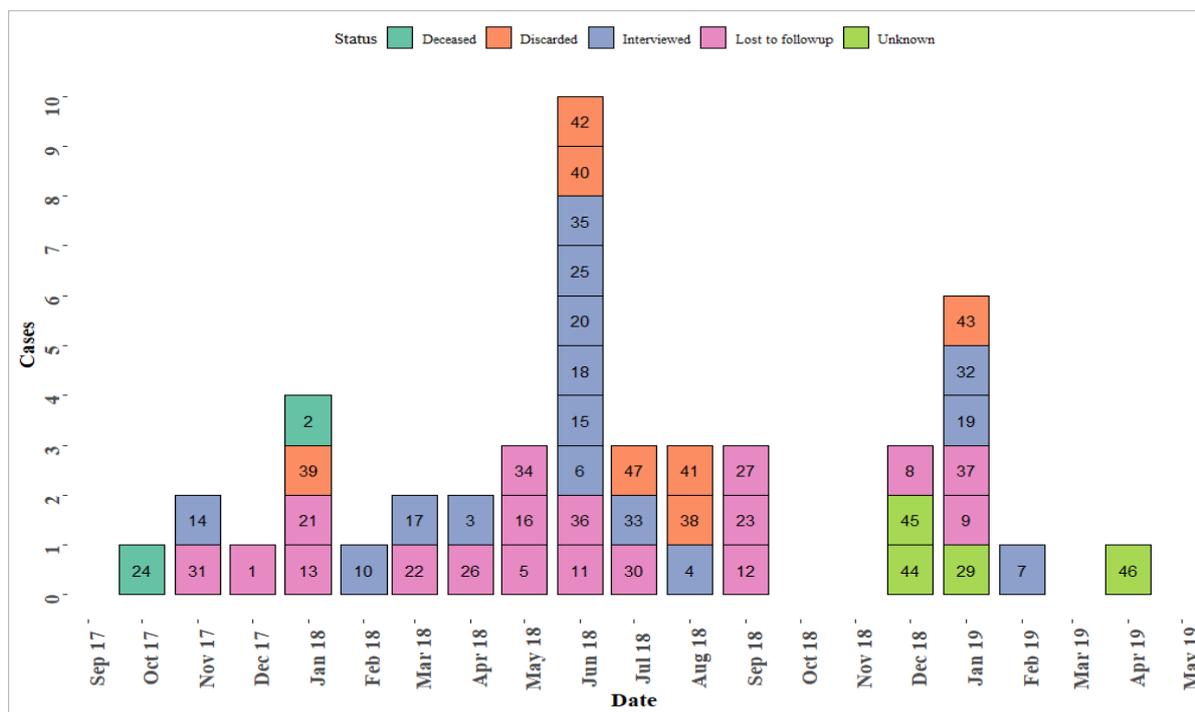


Figure 5: Cases by month of hospital admission, by case status^{1,2}

¹ Where date of hospital admission not available, date of notification to PHW was used (case numbers: 2,5,6,7,16,19,30,32,34,37)

² A date could not be established for one case deceased. This case was a case identified before the first incident meeting in February 2018

10 Enhanced surveillance of injecting risk behaviour

In-depth interviews were undertaken with 15 of the 35 cases, of which three were part of the initial patient case-note review (cases ID: 3, 10 and 14), and two had deceased. The interviews took around one hour and were designed to gather detailed information to provide intelligence on the possible causes and commonalities in risk behaviour between cases, specifically in relation to the control measures identified in April 2018;

- Investigation of the potential contamination of heroin and other drugs being injected by cases and circulating in the area.
- Investigation of any recent changes in the drugs market (types of, or availability of, drugs associated with subsequent infections warranting surgical intervention or ITU admission)

10.1 Demographics

Ten of the 15 cases (67 per cent) interviewed were resident in the ABMU health board area, broadly consistent with the geographic area of residence profile of the 35 cases identified. Table 8 provides the demographic profile of those interviewed. The median age for females was slightly younger at 39 years (range: 27-48 years) compared to males at 42 years (range: 37-50 years). All were PWID and had history of groin injecting.

Table 8: Demographic data including housing status of cases interviewed

Demographics				
Total number of cases	15			
Male	8 (53%)			
Median age (range) in years as at 01/04/2019	41 (27-50)			
Local Authority and Health Board area of residence		Homeless/ unstably housed	Housed	Not Known
Neath Port Talbot	5	2	2	1
Swansea	5	2	3	
ABMU Health Board	10	4	5	1
Torfaen	1	1		
ABU Health Board	1	1		
Gwynedd	1		1	
Wrexham	1	1		
BCU health board	2	1	1	
Cardiff				
Cardiff & Vale University Health Board				
RCT	1		1	
Cwm Taf University Health Board	1		1	
Carmarthenshire	1		1	
Hywel Dda University Health Board	1		1	
Powys Teaching Health Board				
Total	15	6 (40%)	8(53.3%)	1 (6.7%)

10.2 Injecting risk behaviour, prior infections and co-morbidities amongst cases interviewed

Table 9: Summary of injecting risk behaviours, prior infections and co-morbidities

Median age of first injection	25 years (range 16-48 years)	
Median length of injecting career	13 years (2-28 years)	
	Number (n)	Percentage %
Homeless or unstably housed	6	40%
Groin injecting	15	100%
Length of injecting career:		
<3 years (new initiate)	2	13%
3-9 years	3	20%
10 + years	10	67%
Frequency of injecting:		
Less than daily	2	13%
Daily 1-3 times	5	33%
Daily 4 -9 times	6	40%
Daily 10+ times	2	13%
Injecting associated Infection:		
Injecting site infection within 3 months of hospitalisation	10	67%
Infections within previous 24 months:		
DVT	3	20%
Soreness,redness, swelling or abscess	4	27%
Drugs injected in four weeks prior to hospitalisation:		
Heroin only	14	93%
Crack only	4	27%
Heroin and Crack	4	27%
Amphetamine only	2	13%
Drugs smoked:		
In 4 weeks prior to hospitalisation		
Crack	5	33%
SCRAs	1	7%
Recent changes in source of drug (new dealer or new source)	6	40%
By area of residence		
Swansea	4 of 5 respondents	
Neath Port Talbot	2 of 5 respondents	
Reuse and sharing of injecting equipment		
Number of days reuse of own equipment in last week:	9	60%
None	6	40%
one day	3	33%
2-4 days	3	33%
5 or more days	3	33%
Number of times per day reuse of own equipment:		
None	3	20%
once per day	3	33%
2-4 times per day	2	22%
5+ times per day	4	44%
Cleaning prior to reuse of equipment:	9	
Boiling water	5	56%
Hot water	1	11%
Cold water	3	33%
Sharing of used injecting equipment in last four weeks		
Passed on used needle/syringe	3	20%
Used previously used needle/syringe	3	20%
Frontloading/backloading	4	27%
Used previously used filter	3	20%
Shared cooker/spoon	4	27%
Shared water	3	20%
Co-morbidities:		
Problematic alcohol use	2	13%
Mental Health	10	67%

10.3 Reported recent changes in drug use, source or injecting behaviours prior to severe infection

Any changes in drug use prior to infection were reported by 3 of 15 cases, specifically a recent return to injecting from a period of abstinence, initiation of amphetamine injecting and an increase in frequency of injecting.

Six of the cases reported recent changes in the sources of their drugs, citing a new dealer or new sources from Liverpool and London since 2017. All of the six cases were resident in the ABMU health board area.

8 cases reported needing to use more citric acid / acidifier in the preparation or 'cooking up' process which increases the likelihood of tissue damage and increase the risk of infections at the injecting site.

In relation questioning around changes in the way the heroin or drug mix looked or acted when cooking up, a range of responses were given, including:

Heroin

'Bits left in mixture, on last episode used vinegar, hygiene deteriorated due to partner in prison. Heroin changed from fine, light powder to dark solid. Longer time of onset and shorter duration of effect - bad gear'

'Bubbles, dark colour after cooking up, bitty and bits left in the cooker after drawing up. Oily film on top of fluid'

'Last three months more and more solidifying in the barrel. Would bubble and fizz in the cooker, in cooker there was an oily glaze on the top of the fluid'

'Light to dark brown in colour. Dark brown powder bubbles in the cooker and has an 'oil' look to the surface. Looks dirty in the cooker, with a tar look on the bottom. Bits on the filter. Slower onset.'

'Substance is congealing in the syringe'

Amphetamine

'When cooked up orange and purple scale "smells of pickled onion". Amphetamine goes white as soon as it cools, congealed in the barrel.'

'With amphetamine - last time cooked up with tap water - white residue on bottom of cooker - has occurred previously but not the norm. Substance appeared chalky or smell same as normal.'

In addition to these changes in drug use and source, two female respondents reported recent deterioration in hygiene and self-care. One case reported increases in reuse of needles and lack of hygiene in injecting due to her partner going to prison. Her partner normally collected sterile injecting equipment. Another case reported lack of self-care and hygiene in her injecting practices due to deterioration in mental health as a consequence of grief. A further male case had recently become street homeless and stated that it was impossible to maintain hygienic injecting practices and cited using puddle water in the preparation of his heroin to inject.

Content of samples tested

The substance misuse programme team tested a number of samples of heroin and amphetamine circulating in the area via the WEDINOS laboratory and provided a profile of the psychoactive substances contained within the samples. None of the samples tested were contaminated with other illicit substances and did not contain combinations of substances other than the amphetamine which contained caffeine. Amphetamine purchased on the street is normally around 9-15 per cent pure having been cut with caffeine and other non-psychoactive substances including chalk. The purity of heroin is around 40-50 per cent in Wales. WEDINOS is not able to identify bacterial contaminants in samples provided.

Access to sterile injecting equipment, reuse and sharing of injecting equipment

All of the 15 respondents interviewed reported accessing needle and syringe programmes (NSP) in the four weeks prior to hospitalisation. Two attended pharmacy NSP services only, with the remaining 13 cases reported accessing sterile injecting equipment from a combination of drug services, pharmacy NSPs, friends, partners or dealers. Pharmacy NSPs were reported as the main source of equipment for 7 respondents (47%). Every attendance at an NSP represents an opportunity to identify and advise on injecting site infections or complications related to injecting practice.

Of those reporting reuse, the number of times a day the equipment was reused ranged from 1 to 2 times per day to 8 or more times per day. Reuse of own equipment represents a clear risk not only of bacterial infection but also of increased injecting site / vein damage and risk of sharing by others as the equipment has not been disposed of.

11 Main findings

- Following initial notification of four cases of severe infections requiring radical surgical intervention or ITU admission amongst people who inject drugs (PWID) in ABMU Health Board, a total of 35 confirmed cases were identified between 1st November 2017 and 1st April 2019 in Wales, with two case now deceased
- Of the 35 cases identified, 19 (54 per cent) were male. Data on injecting drug use from the Harm Reduction Database and wider academic evidence indicates a 70:30 male to female ratio amongst PWID. There is a greater than expected representation of females amongst the cases identified
- The median age was 38 (range 23 to 57 years). All cases were resident in Wales with the majority, 54 per cent, resident within the ABMUHB area. Given the initial notification and priority given to this incident within AMBUHB, it may be that all cases were identified and reported within this health board area / hospital whilst cases may have been under reported in other health board areas. Further interrogation of PEDW and laboratory data is required to investigate this
- Clinical presenting symptom data was recorded for 29 of 35 cases (83%). Of these, all had muscle or groin infections such as groin abscess /Staphylococcus aureus infection, psoas abscesses, myositis, necrotising fasciitis, osteomyelitis or femoral pseudoaneurysms. 5/35 had infective endocarditis, 1/35 had a cavitating pneumonia
- No common species was identified with a range of gram positive and gram negative organisms detected
- Surgical intervention is recorded for 19 cases, including amputations and valve replacements. Four hip disarticulation procedures were required amongst people aged between 32 and 43 years.
- Following notification from Health Protection teams, request for in-depth interviews was successful in 15 of the 34 cases (35 cases – one deceased), representing a 44 per cent response rate
- Five of the nine reviewed cases and 10 interviewed cases were either admitted or presented to Emergency departments for injecting related infections in the six months prior to the reporting event with infections including DVT, abscesses and aneurysm. Three cases attempted to self-treat their infections
- Median age of first injecting was 25 years (range 16 to 48 years). The median length of injecting career was 13 years (range 2 to 28 years). There was no clear pattern in relation to age and length of injecting career. Six of the 15 cases (40%) were unstably housed or homeless

- Injecting risk behaviour was high:
 - All reported groin injecting. Groin injecting has historically been considered one of the last routes of injecting, initiated veins in the arms, legs, hands and feet are no longer viable. More recently, however, there has been a trend to groin injecting to avoid easily visible signs of injecting drug use and associated stigma. Data from the Harm Reduction Database – Needle and Syringe Programme (NSP) module 2017/18 indicates that overall, 19 per cent of individuals accessing NSP services in Wales and injecting psychoactive drugs report groin injecting, with higher rates reported in Abertawe Bro Morgannwg (24 per cent), Aneurin Bevan (23 per cent) and Betsi Cadwaladr University Health Boards (25 per cent).
 - The majority injecting heroin, heroin and crack or amphetamine and one case injecting amphetamine only
 - Frequency of injecting was reported by eight cases as between 4 and 10 or more times daily
 - Reuse of injecting equipment reported in 4/5 respondents resident in Swansea and in 3/ 5 respondents in Neath Port Talbot. Rates and frequency of reuse of injecting equipment were high, with reuse reported multiple times per day

- There was some evidence of changes in supply of drugs injected in the weeks and months preceding severe infection in the AMBUHB area. In addition, there was evidence of poor quality drugs with residues and increases in acidifiers required during the preparation process leading to increased likelihood of injecting site infections

- Whilst available drugs including heroin and amphetamine in circulation did not indicate contamination with other psychoactive substances, as tested by WEDINOS, it was not possible to test the samples for bacterial contamination

- Two-thirds of respondents interviewed reported co-morbid mental health issues

12 Recommendations

The investigation found 35 cases of severe infection in PWID, mainly reported from the Swansea Bay area. There was a high prevalence of groin injection, skin infections prior to the onset of severe infection, and a higher proportion of females than would be expected for the known PWID population. Therefore, we recommend interventions to raise awareness and minimise harm related to injecting, to reduce the risk of minor infections becoming severe, to engage PWID with preventive and treatment services, and to manage complex cases using a multidisciplinary approach. The effectiveness of these measures should be monitored by surveillance of specific infections in PWID across Wales.

- 1. Public Health Wales will work with clinical teams including IP&C, ITU, Orthopaedics, Vascular Surgery and Microbiology, to establish a routine monitoring system for severe infections incorporating risk factor data including injecting drug use.** Recent data on MSSA bacteraemia in Wales indicated that for 2015-17, injecting drug use accounted for 18.4 per cent of community-acquired and 5.5 per cent of hospital-acquired MSSA infections in Wales. Robust and routine investigation of the scale and nature of infections, life-changing surgical interventions including amputations and associated health and social costs amongst PWID would support implementation of effective methods of community infection prevention and harm reduction and realignment of resources to prevention.
- 2. Substance Misuse Area Planning Boards and Health Boards in Wales to support the prevention of serious infections amongst PWID through provision of community or district nurse care in substance misuse services alongside implementation of ACT self-care wound packs programme across Wales, including appropriate training of relevant staff, peer groups and health professionals.** Currently in Wales there is substantial disparity in the provision of community-based wound care or injecting related infections. All services aimed at homeless and vulnerable populations and substance misuse services should have regular provision for the early identification, and treatment of injecting site infections to prevent escalation to hospitalisation and surgical intervention.
- 3. Public Health Wales to support all Area Planning Boards in Wales with information and resources to support a targeted national awareness/education programme to increase awareness of the dangers and symptoms related to groin injecting.** Public Health Wales Substance Misuse Team along with colleagues in drug services and specialist nurses for vulnerable populations have developed tools for use with high risk PWID including posters, training and the Harm Reduction Wales website: www.harmreductionwales.org
- 4. Area Planning Boards shall scope, develop and implement mobile services and detached teams allied to substance misuse services to engage/re-engage with PWID and those at risk of initiation across Wales, encourage and increase uptake of needle and syringe programmes, develop peer harm reduction networks and reduce high risk injecting behaviours.**
- 5. Health Board community based clinical teams to lead on establishment of extraordinary multidisciplinary case review panels for individuals with complex needs.** The extraordinary reviews should be initiated by any relevant agency working with the individual. The reviews are

aimed at those with problematic substance use and acute or chronic severe infections requiring pain management, surgical / clinical intervention and involve, local authority including social services and housing and specialist substance misuse representation for care pathway development and ongoing care.

13 Appendices

Appendix A – Briefing to all Health Board areas for enhanced surveillance of severe infections amongst PWID

Public Health Wales Briefing: Severe infections in people who inject drugs Alert and enhanced surveillance responses
Date of briefing: 24-Jun-19
Intended audience: <ul style="list-style-type: none">• Health Boards (DsPH and Medical Directors) –for distribution to surgical teams, emergency departments and intensive care• Substance misuse services• Microbiologists and infectious disease specialists (Public Health Wales and other)• PHW Health Protection Team• PHE• Welsh Government
<p>Background</p> <p>In February 2018, microbiology and surgical consultants in Morriston Hospital notified Public Health Wales of several cases of severe infections in people who inject drugs (PWID), in particular cases requiring radical surgical intervention to limbs - 4 patients had required hip disarticulation (complete removal of the lower limb at the hip joint) since November 2017. Further cases requiring intensive care admission (ITU) were also reported.</p> <p>Public Health Wales Health Protection division investigated the background rate of this procedure and gathered information on surgical and ITU cases in Morriston Hospital.</p> <p>In response Public Health Wales would like to request that clinicians report relevant cases since the start of 2018 to the Health Protection Team for follow up (section 3.1 below). We are also bringing this matter to the attention of clinicians, microbiologists and substance misuse services.</p>
<ul style="list-style-type: none">• Initial findings <p>9 cases of severe infection in PWID (either requiring surgical intervention or ITU admission) were identified in residents of ABMU Health Board, from 1 November 2017 to April 2018. Of these 9:</p> <ul style="list-style-type: none">• 4 had a hip disarticulation procedure – the annual number of these procedures across Wales was between 1 - 5 from 2012 to 2017, with a mean of 2.8 per year. These 4 cases were younger and more likely to be female than those undergoing this procedure in recent years.• 8 had bacterial or fungal infection isolates from a normally sterile site; and 1 had other evidence of infection.• 5 cases were male and 4 female, aged 26-57 years (median 35)• 7 had muscle or groin infections such as psoas abscesses, myositis, necrotising fasciitis, or femoral pseudoaneurysms• 2 had infective endocarditis; and 1 had a cavitating pneumonia.• All 9 required ITU admission; 7 required surgical intervention.

- 5 cases were admitted 3 or more days after onset; with 1 case being admitted 14 days after onset.
- All 9 cases reported recent injecting into the groin (from patient notes); the background prevalence of groin injection in Wales is 23%.

- Requested Actions/Implications
 - Clinicians (surgical and ITU teams)

Clinicians, especially those treating PWID for infections, should be aware of the possibility of worsening and severe infections in PWID, who may present late. Groin injection appears to be a risk factor.

Clinicians are asked to please notify the Health Protection Team on:

- 0300 00 300 32 or
- aware@wales.nhs.uk

any cases which meets the following definition:

A patient known to be a PWID with evidence of infection – by isolation of bacteria or fungi isolated from a normally sterile site or abscess, or imaging / similar evidence of infection - necessitating surgical intervention or ITU/HDU admission

Any reports will be followed up by the Health Protection division to assist with identifying common risk factors and supporting appropriate preventive measures. This surveillance will also evaluate the extent of the problem and its time course.

- Microbiologists

Microbiologists are asked to support and encourage local clinicians to identify and report relevant cases to the Health Protection Team for follow up. They may also report cases of which they are made aware.

Appendix B: Copy of letter to patients for completion of enhanced surveillance



Iechyd Cyhoeddus Cymru
Rhif 2 Capital Quarter, Stryd Tyndall,
Caerdydd CF10 4BZ
Ffôn: 029 2022 7744

Public Health Wales
Number 2 Capital Quarter, Tyndall Street,
Cardiff CF10 4BZ
Tel: 029 2022 7744

Date:

Patient name and address

Dear (D.O.B: xx/xx/xxxx)

Following your admission to hospital on xx/xx/xx; members of the Public Health Wales, Health Protection Team, would very much like to speak to you to gain a better understanding of the circumstances leading to your infection, hospitalisation and resulting interventions.

Please contact the team on **02920 104649**. If we do not hear from you by telephone, we may look to call at your address to arrange a meeting.

We look forward to hearing from you

Regards

Josie Smith – Health Protection Team

Dean Acreman – Health Protection Team

Appendix C – Enhanced Surveillance Form – Severe Infections amongst PWID

Enhanced Surveillance Exposure Form: Severe Infections in People Who Inject Drugs																			
<p><i>Case definition: A patient known to be a person who injects drugs (PWID) with evidence of infection – by isolation of bacteria or fungi isolated from a normally sterile site or abscess, or imaging/similar evidence of infection – necessitating surgical intervention or ITU/HDU admission since 31st January 2018</i></p>																			
QA 01	<table border="1"> <tr> <td>Interviewer Initials</td> <td>Patient Identifier code: <input type="text"/></td> </tr> </table>	Interviewer Initials	Patient Identifier code: <input type="text"/>																
Interviewer Initials	Patient Identifier code: <input type="text"/>																		
QA 02	In which city/area is this interview being conducted?																		
CHECKLIST - (if yes to all questions appropriate to continue):																			
QA 03	<table border="1"> <tr> <td>Person who injects drugs?</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Bacteria or fungi have been isolated from a normally sterile site (joint, blood) or abscess OR imaging or similar evidence of infection?</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Patient required surgical intervention OR Patient admitted to ITU/HDU</td> <td>Yes</td> <td>No</td> </tr> </table>	Person who injects drugs?	Yes	No	Bacteria or fungi have been isolated from a normally sterile site (joint, blood) or abscess OR imaging or similar evidence of infection?	Yes	No	Patient required surgical intervention OR Patient admitted to ITU/HDU	Yes	No									
Person who injects drugs?	Yes	No																	
Bacteria or fungi have been isolated from a normally sterile site (joint, blood) or abscess OR imaging or similar evidence of infection?	Yes	No																	
Patient required surgical intervention OR Patient admitted to ITU/HDU	Yes	No																	
Part A: Health Protection Team to complete following notification																			
QA 06	<table border="1"> <tr> <td>Patient Details:</td> <td></td> </tr> <tr> <td>QA 06 First Name</td> <td><input type="text"/></td> </tr> <tr> <td>QA 07 Family Name</td> <td><input type="text"/></td> </tr> <tr> <td>QA 08 NHS number</td> <td><input type="text"/></td> </tr> <tr> <td>QA 09 Date of birth (DD/MM/YYYY)</td> <td><input type="text"/></td> </tr> <tr> <td>QA 10 Sex</td> <td>Male <input type="checkbox"/> Female <input type="checkbox"/></td> </tr> <tr> <td>QA 11 Ethnicity</td> <td><input type="text"/></td> </tr> <tr> <td>QA 12 Address if available: (if NFA - use C/O address)</td> <td><input type="text"/></td> </tr> <tr> <td>Postcode</td> <td><input type="text"/></td> </tr> </table>	Patient Details:		QA 06 First Name	<input type="text"/>	QA 07 Family Name	<input type="text"/>	QA 08 NHS number	<input type="text"/>	QA 09 Date of birth (DD/MM/YYYY)	<input type="text"/>	QA 10 Sex	Male <input type="checkbox"/> Female <input type="checkbox"/>	QA 11 Ethnicity	<input type="text"/>	QA 12 Address if available: (if NFA - use C/O address)	<input type="text"/>	Postcode	<input type="text"/>
Patient Details:																			
QA 06 First Name	<input type="text"/>																		
QA 07 Family Name	<input type="text"/>																		
QA 08 NHS number	<input type="text"/>																		
QA 09 Date of birth (DD/MM/YYYY)	<input type="text"/>																		
QA 10 Sex	Male <input type="checkbox"/> Female <input type="checkbox"/>																		
QA 11 Ethnicity	<input type="text"/>																		
QA 12 Address if available: (if NFA - use C/O address)	<input type="text"/>																		
Postcode	<input type="text"/>																		
QA 13	<table border="1"> <tr> <td>During the last 12 months, where did you live most of the time?</td> <td> <input type="checkbox"/> 1 My own (or my spouse or partner's) house, flat, or apartment (rented or owned) <input type="checkbox"/> 2 In my parents' house, flat or apartment <input type="checkbox"/> 3 In someone's else's (relatives, friends) house, flat or apartment <input type="checkbox"/> 4 Hostel <input type="checkbox"/> 5 Squat <input type="checkbox"/> 6 No fixed address (e.g. street, park, abandoned building) <input type="checkbox"/> 7 Drug treatment institution <input type="checkbox"/> 8 Jail/prison <input type="checkbox"/> 9 Other (specify) <input type="checkbox"/> 10 No response </td> </tr> <tr> <td>(Do not read out response options. Tick ONE response)</td> <td></td> </tr> </table>	During the last 12 months, where did you live most of the time?	<input type="checkbox"/> 1 My own (or my spouse or partner's) house, flat, or apartment (rented or owned) <input type="checkbox"/> 2 In my parents' house, flat or apartment <input type="checkbox"/> 3 In someone's else's (relatives, friends) house, flat or apartment <input type="checkbox"/> 4 Hostel <input type="checkbox"/> 5 Squat <input type="checkbox"/> 6 No fixed address (e.g. street, park, abandoned building) <input type="checkbox"/> 7 Drug treatment institution <input type="checkbox"/> 8 Jail/prison <input type="checkbox"/> 9 Other (specify) <input type="checkbox"/> 10 No response	(Do not read out response options. Tick ONE response)															
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(Do not read out response options. Tick ONE response)																			

QA 14	Admitting hospital	<input type="text"/>
QA 15	Date of admission (DD/MM/YYYY)	<input type="text"/>
QA 16	Diagnosis	<input type="text"/>
QA 17	Onset of symptoms (DD/MM/YYYY)	<input type="text"/>
QA 18	significant or severe)	Procedure: <input type="text"/> Date: <input type="text"/>
QA 19	Admission to ITU/HDU (if appropriate)	Date: <input type="text"/> Duration: <input type="text"/>
QA 20	Vital status (on date of notification)	Inpatient <input type="checkbox"/> Discharged <input type="checkbox"/> Died <input type="checkbox"/>
Microbiological details:		
QA 21	Bacteria or fungi isolated from a normally sterile site (joint, blood) or abscess	Date: <input type="text"/>
		Site 1: <input type="text"/>
		Organism/s relating to site 1: <input type="text"/>
		Site 2: <input type="text"/>
		Organism/s relating to site 2: <input type="text"/>
QA 22	Bacteria or fungi cultured from any site from this patient	Date: <input type="text"/>
		Site: <input type="text"/>
		Organism/s: <input type="text"/>
QA 23	Please give a brief description of the clinical picture on admission and likely diagnosis	
	<input type="text"/>	
QA 24	Antibiotic history for this episode up to the point of relevant sample being sent for microbiological	
	<input type="text"/>	

Part B: Patient questionnaire - events prior to recent admission

'Tell me what happened to lead you to this situation'.....'How did you end up here?'

GB	25	Have you had an injecting site infection; soreness, redness, swelling or abscess in the last 3 months? If no, what lead to this event?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Details:
GB	26	If yes, what did you do? (tick all that apply)	Self-treat <input type="checkbox"/>	Describe:	
		Additional details:	Attend GP	Yes <input type="checkbox"/>	No <input type="checkbox"/>
			Attend Hospital (A&E)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
			Receive antibiotics	Yes <input type="checkbox"/>	No <input type="checkbox"/>
			Complete course of	Yes <input type="checkbox"/>	No <input type="checkbox"/>
GB	27	a	In the last 24 months (apart from this event) have you had any of these happen at a site you have injected in to?	Redness, swelling and tenderness <input type="checkbox"/> 1 An abscess (swelling containing pus) <input type="checkbox"/> 2 A sore / open wound <input type="checkbox"/> 3 Blood poisoning /septicaemia <input type="checkbox"/> 4 Deep vein thrombosis <input type="checkbox"/> 5 None of these <input type="checkbox"/> 6	
		b	Did you seek medical advice because of this?	Yes 1 No 0 Refused 9	
		c	Where did you go to get advice?	A&E dept <input type="checkbox"/> 1 GP <input type="checkbox"/> 2 Drug service <input type="checkbox"/> 3 Other <input type="checkbox"/> 4	
		d	Were you admitted to hospital?	Yes 1 No 0 Refused 9	
		e	Are you currently registered with a GP?	Yes 1 No 0	
Part C: Patient questionnaire - drug history, injecting practice and any recent changes					
GC	28	How old were you when you very first injected a drug?	Age in years		
GC	29	During the last 4 weeks (prior to admission) how many days did you inject? ["Every day" = 28]	<input type="text"/> <input type="text"/>	days	if not when was last time <input type="text"/> <input type="text"/> months
GC	30	On the last full day you injected, how many times did you inject?	<input type="text"/> <input type="text"/>	number of times	or <input type="text"/> to <input type="text"/>
GC	31	Do you inject yourself or does someone inject you?	<input type="text"/>		
GC	32	How many people were with you in the same room, car or group (if outside) last time you injected.	<input type="text"/>	Was this typical? Yes <input type="checkbox"/> No <input type="checkbox"/>	if no, Please describe usual injecting cohort/network? <input type="text"/>

GC	33	Drug history	Ever injected	Injection in last year	Injection in last 4 weeks	Age 1st injection
	a	Heroin alone	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	b	Crack alone	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	c	Heroin & crack together	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	d	Cocaine alone	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	e	Heroin & powder cocaine together	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	f	Methadone	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	g	Subutex/buprenorphine	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	h	Amphetamine	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	i	Benzodiazepines	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	j	Other stimulants including MCAT	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	k	Other (specify)	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
		Which drug do you inject most frequently?	<input type="text"/>			
			ever smoked?	smoked in last year?	smoked in last 4 weeks?	Age 1st smoked
	l	smoking crack	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
	m	smoking pipe	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="text"/>
GC	34					
	a.	Have you changed your drug use in the last 6 months?	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
	b.	Changes in source of drugs?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="text"/>	
	c.	Changes in type of drugs	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="text"/>	
	d.	Changes in frequency of injecting	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="text"/>	
	e.	Changes in site of injecting, combinations of drugs injected, or changes in drugs smoked but drugs injected unchanged	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="text"/>	
	f.	Provide additional details:	<input type="text"/>			

GC 35	What have you used to dissolve/prepare your drugs for injection in the last 4 weeks?	Citric acid <input type="checkbox"/> Vitamin C or ascorbic acid <input type="checkbox"/> Lemon juice <input type="checkbox"/> Vinegar <input type="checkbox"/> Other <input type="checkbox"/>																																								
GC 36	Have you made any changes in the drug preparation, e.g. had to use more citric/vit C? Please describe	<input type="text"/>																																								
GC 37	Has the heroin / drug mix looked or behaved differently when being cooked up and injected? Please describe including experience, onset, duration, colour, stickiness, etc	<input type="text"/>																																								
GC 38	a Info which parts of your body have you injected in the last 4 weeks? b Info which parts of your body have you injected in the last 12 months? c Please describe route and transition of injecting site: Duration of injecting career before groin injecting and length of groin injecting career	Last 4 weeks Last year Arms <input type="checkbox"/> <input type="checkbox"/> Legs <input type="checkbox"/> <input type="checkbox"/> Groin <input type="checkbox"/> <input type="checkbox"/>																																								
GC 38	In the last 4 weeks, when injecting, from which of these places did you get your needles and or syringes?	(Tick one box) Last 4 Weeks? Main source? <table border="1"> <tr> <td>Yes</td><td><input type="checkbox"/></td> <td>No</td><td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>
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Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>																																						
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>																																						
GC 40	How often in the last week of injecting did you have to reuse your own needles/syringes?	Number of days Number of times each day																																								
GC 41	a Do you ever clean needles and syringes before re-using them? b If yes, how do you usually clean needles and syringes before using them?	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 0 Don't know <input type="checkbox"/> 8 No response <input type="checkbox"/> 8 <table border="1"> <tr> <td>Cold water</td><td><input type="checkbox"/></td><td>1</td> </tr> <tr> <td>Hot water</td><td><input type="checkbox"/></td><td>2</td> </tr> <tr> <td>Boiling Water</td><td><input type="checkbox"/></td><td>3</td> </tr> <tr> <td>Soap or detergent</td><td><input type="checkbox"/></td><td>4</td> </tr> <tr> <td>Bleach</td><td><input type="checkbox"/></td><td>5</td> </tr> <tr> <td>Alcohol</td><td><input type="checkbox"/></td><td>6</td> </tr> <tr> <td>Don't know</td><td><input type="checkbox"/></td><td>7</td> </tr> <tr> <td>Other</td><td><input type="checkbox"/></td><td>8</td> </tr> </table>	Cold water	<input type="checkbox"/>	1	Hot water	<input type="checkbox"/>	2	Boiling Water	<input type="checkbox"/>	3	Soap or detergent	<input type="checkbox"/>	4	Bleach	<input type="checkbox"/>	5	Alcohol	<input type="checkbox"/>	6	Don't know	<input type="checkbox"/>	7	Other	<input type="checkbox"/>	8																
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Alcohol	<input type="checkbox"/>	6																																								
Don't know	<input type="checkbox"/>	7																																								
Other	<input type="checkbox"/>	8																																								

QC	42	In the last 4 weeks when injecting, <u>to how many different people</u> might you have <u>passed</u> on used needles or syringes (including your partner)?	<input type="text"/> <input type="text"/>	Number of people [If don't know 88, no response 99]
QC	43	In the last 4 weeks when injecting, <u>from how many different people</u> might you have <u>received</u> used needles or syringes (including your partner)?	<input type="text"/> <input type="text"/>	Number of people [If don't know 88, no response 99]
QC	44	Of the people you received used needles or syringes from, how many were people you had injected with before?	<input type="text"/> <input type="text"/>	Number of people
QC	45	In the last 4 weeks, on how many <u>different occasions</u> did you inject using needles or syringes that had been previously used by someone else?	<input type="text"/> <input type="text"/>	Number of times [If don't know 88, no response 99]
QC	46	In the last 4 weeks when injecting, how often did you:		
	a	inject drugs using a syringe after it had been filled from somebody else's used syringe? (frontloading/backloading/ splitting)	Never <input type="checkbox"/> 1 Rarely <input type="checkbox"/> 2 Sometimes <input type="checkbox"/> 3 Always <input type="checkbox"/> 4 Don't know <input type="checkbox"/> 9 No response <input type="checkbox"/> 8	
QC	46	b	use a filter into which someone else had previously put a used syringe?	Never <input type="checkbox"/> 1 Rarely <input type="checkbox"/> 2 Sometimes <input type="checkbox"/> 3 Always <input type="checkbox"/> 4 Don't know <input type="checkbox"/> 9 No response <input type="checkbox"/> 8
QC	46	c.	drawn up from a cooker / spoon which someone else had put a <u>used</u> syringe?	Never <input type="checkbox"/> 1 Rarely <input type="checkbox"/> 2 Sometimes <input type="checkbox"/> 3 Always <input type="checkbox"/> 4 Don't know <input type="checkbox"/> 9 No response <input type="checkbox"/> 8
QC	46	d.	used the same water as others for flushing / cleaning?	Never <input type="checkbox"/> 1 Rarely <input type="checkbox"/> 2 Sometimes <input type="checkbox"/> 3 Always <input type="checkbox"/> 4 Don't know <input type="checkbox"/> 9 No response <input type="checkbox"/> 8
QC	47	a	How long ago was the last occasion you injected with needles and/or syringes previously used by someone else? [If Never put 999]	<input type="text"/> <input type="text"/> <input type="text"/> days <input type="text"/> <input type="text"/> <input type="text"/> weeks <input type="text"/> <input type="text"/> <input type="text"/> months <input type="text"/> <input type="text"/> <input type="text"/> never Who was it with? E.g partner or friends
QC	47	b	How many other people were there on this last occasion?	<input type="text"/> <input type="text"/> <input type="text"/> Number of people
QF	48	How many times do you think you may have accidentally mixed up your works with someone elses in the last 4 weeks when injecting?		
		<input type="text"/> <input type="text"/> <input type="text"/>		

Co-morbidities:

QA 49 Blood-borne viruses (Tick all that apply) HBV HCV HIV

QA 50 Problematic alcohol use (self-report or in treatment) Yes No

QA 51 Physical health conditions (Please detail):

QA 52 Mental health conditions (Please detail):

That is the end of the questions.. Thank you very much

