Regional Public Health
Better Health For The Greater Wellington Region

PUBLIC HEALTH POST

Public Health for Primary Care in Wellington, Wairarapa and the Hutt Valley

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LEAD NOTIFICATION AND RESPONSE

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Image credit: Alchemist-hp 2010. Wikimedia Commons.

Key Points

- An elevated blood lead level ≥0.48 umol/L is a notifiable condition in New Zealand.
- From 2014-2015 there were 42 lead notifications in the Greater Wellington Region.
- Key risk factors for lead poisoning are occupational (e.g. painter/decorator or metal worker), and non-occupational work with leaded paint or small-bore ammunition.
- Lead poisoning can present with a variety of different clinical features (including asymptomatic).
- Notifications of elevated blood levels are made through BPAC to the HSDIRT database managed by Massey University on behalf of the Ministry of Health.

Background

Lead is a heavy metal which can cause toxicity in humans.[1] Elevated whole blood lead levels arising from environmental exposure is notifiable under the Health Act 1956.[2]

Common sources of lead exposure in New Zealand include household and other paints made before 1965 and the use of small-bore firearms.[3,4] Prior to 1996, exposure to leaded petrol was another source of exposure.[5]

Epidemiology

Currently, lead notifications are recorded in the HSDIRT database. This database has been operational since early 2013 in the Wellington region. The following will describe notifications over the two full-years of 2014-2015.

Overall, 42 new notifications were recorded in HSDIRT for the two-year period (23 in 2014 and 19 in 2015). On considering the demographics of these notifications, the most commonly recorded age group were those aged over 45 years (57%); one notification was recorded for a child (Figure 1). Males accounted for 86% of notifications and New Zealand Europeans for 81% (Figure 2). Capital & Coast District Health Board (CCDHB) recorded 52.4% of notifications, followed by Hutt Valley District Health Board (HVDHB) (26.2%) and Wairarapa District Health Board (WDHB) (21.4%). National reporting on HSDIRT for 2014, found that WDHB had the highest rate of lead notifications in the country.[4]

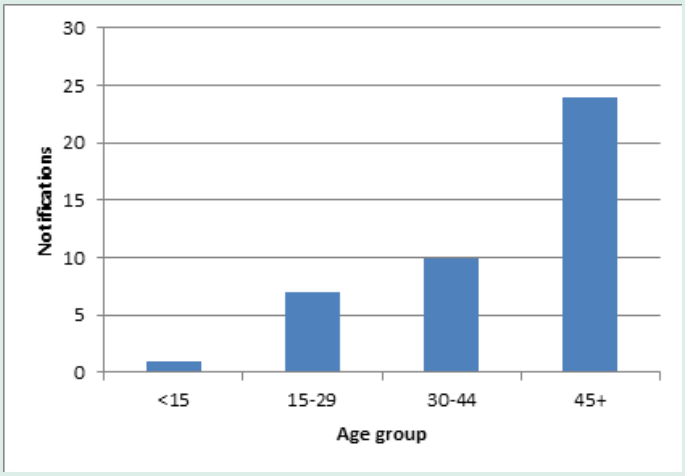


Figure 1. Lead notifications in the Wellington region 2014 – 2015 by age.

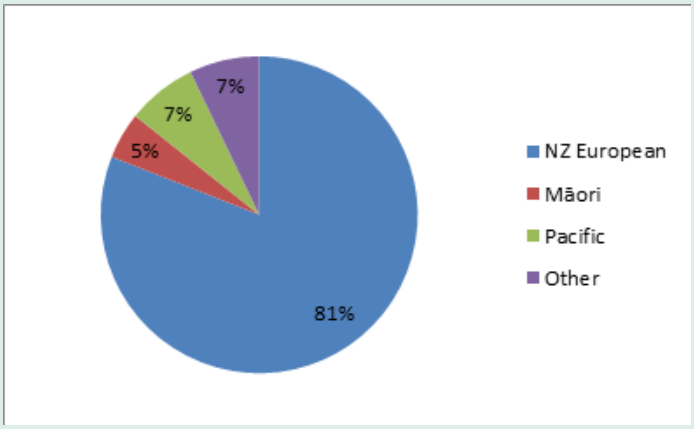


Figure 2. Lead notifications in the Wellington region 2014 – 2015 by ethnicity.

Considered by exposure type, 22 (52%) of the notifications were occupational exposures, with the most common recorded occupation being painters/decorators (n=7), followed by welders and metal workers (n=4). Non-occupational notifications were mainly due to small-bore firearms (n=6) and house paint exposure (n=4).

Clinical symptoms

The clinical effects of lead exposure will depend on exposure type – acute versus chronic – and the age of the patient. It is important to note that in many instances, chronic exposure may not present with any manifestation at all.[1,6] Clinical manifestations are depicted in Table 1.

Table 1. Clinical manifestations of lead poisoning.[7]

Child		
Mild Lead Toxicity (>10 ug/dL or >0.48 um/L blood lead)	**Moderate Lead Toxicity** (>50 to 70 ug/dL or >2.42-3.38 umol/L blood lead)	**Severe Lead Toxicity** (>70 to 100 ug/dL or >3.38-4.83 umol/L blood lead)
Impaired cognition Impaired behaviour Impaired fine motor coordination Impaired hearing Impaired growth	"Difficult child" Hyperirritable behaviour Intermittent lethargy Decreased interest in play Intermittent vomiting Abdominal pain Anorexia	Encephalopathy Coma Altered sensorium Seizures Bizarre behaviour Ataxia In-coordination Loss of developmental skills Papilloedema Cranial nerve palsy Signs of raised ICP Persistent vomiting Pallor (anaemia)
Adult		
Mild Lead Toxicity (>40 ug/dL or >1.93 umol/L blood lead)	**Moderate Lead Toxicity** (>80 ug/dL or >3.86 umol/Lblood lead)	**Severe Lead Toxicity** (>100 to 150 ug/dL or >4.84-7.25 umol/L blood lead)
Tiredness Somnolence Moodiness Lessened interest in leisure activities Impaired psychometrics Hypertension	Headache Memory loss Decreased libido Insomnia Metallic taste Abdominal pain Anorexia Constipation Mild anaemia Myalgias Muscle weakness Arthralgias	Encephalopathy Coma Seizures Obtundation Delirium Focal motor disturbances Papilloedema Optic neuritis Signs of ICP Foot drop Wrist drop Abdominal colic Pallor (anaemia) Nephropathy

Laboratory features

The key laboratory test for diagnosis is the whole blood lead level.[1,6] An elevated blood lead is notifiable in New Zealand, with the notification level being ≥0.48 μ mol/l.[8]

Management and treatment

The management and treatment of a high blood lead level will depend on a number of variables, including: type of exposure (occupational/non-occupational); age; and, lead levels.[1,3,6,7]

In some instances, routine monitoring is all that is required.[3,7] In other instances, more rigorous assessment, exposure reduction strategies and possibly treatment will be required (e.g. chelation).[3,7] A detailed discussion of the management of a lead notification can be found at the Ministry of Health and TOXINZ websites. (See section on 'Further Information').

It is important to note that occupational exposures may also be notifiable to Worksafe NZ (formerly the Department of Labour) under the Notifiable Occupational Disease System (NODS).[9] The threshold for notification under NODS is a blood lead level ≥2.4 μ mol/l. Notifcations can be completed by the employee/employer, or if the employee consents, a medical practitioner. The Medical Officer of Health is also required to notify Worksafe NZ of occupational lead exposures with the new Health and Safety at Work Act. Finally, a worker can also be suspended from work (or be transferred to a role with little lead exposure) with a single lead blood level of ≥2.4 μ mol/l.[9]

How to notify a case to public health?

Lead (and other hazardous substance) notifications are now made under the HSDIRT system, using the electronic reporting system on BPAC (available on Medtech32, My Practice, and Profile for Windows) under 'Hazardous Substances & Lead Notifications' on the dashboard or via **www.bestpractice.org.nz** (Figure 3).

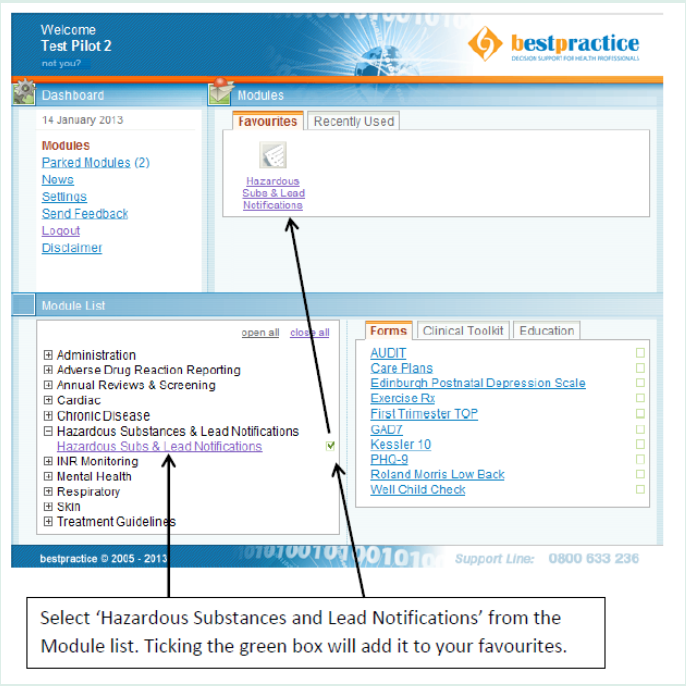


Figure 3. HSDIRT access point on best practice.

The notification can be completed when the blood levels are available (or for other suspected hazardous substances, health impacts at the time of consultation). Please remember to complete information under the three tabs: exposure event, assessment, and notifier/patient details (which is usually prepopulated) (Figures 4 & 5).

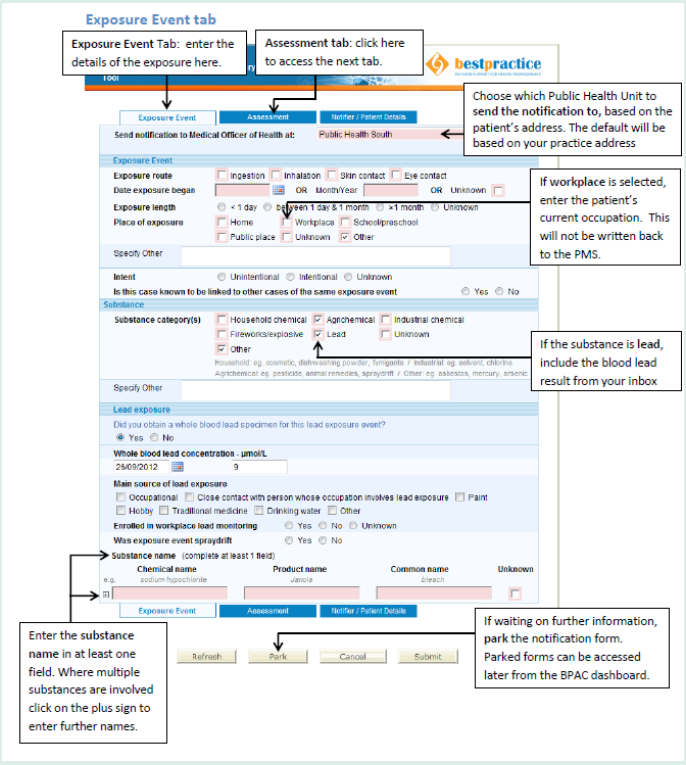


Figure 4. HSDIRT interface 1.

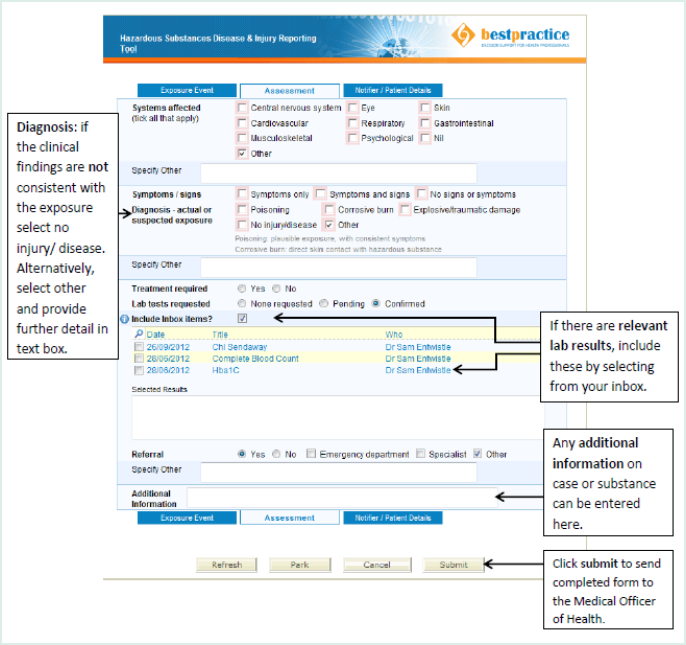


Figure 5. HSDIRT interface 2.

Practice management software may have shortcut buttons allowing quicker access to the BPAC hazardous substance notification form.

Public health priorities and management following notification

From a public health perspective, individual notifications that are occupational or small-bore rifle exposure related, are not a high priority, as individuals engaged in these activities are normally aware of the exposure risks and are often routinely tested. However, clusters of occupational or rifle exposure related notifications may require public health input. In addition, it is important to exclude unintended exposures for others, e.g. a child exposed to lead dust on work clothing brought home. Non-occupational painting/decorating (e.g. doing up an old house) and elevated levels in children are a higher priority. These groups are typically unaware of the harms of lead exposure, are generally unaware of ways to mitigate the risk of exposure and are more likely to benefit from public health intervention.

Public health management of a lead notification involves a number of steps which include:

- Interviewing the case to identify potential sources of exposure (both occupational and non-occupational);
- If necessary, undertaking an assessment of the home (or referring to WorkSafe NZ if the workplace is involved) to identify possible sources of exposure;
- Ascertain if others are potentially exposed or at risk of exposure and provide advice on need for testing;
- Provide advice on ways and means to reduce levels of exposure (e.g. safe work practices and clean-up procedures if painting);
- Provide education on health effects of lead and means to reduce future exposures.

Further information:

For more information on this topic please refer to the following sites:

Ministry of Health guidance on management of lead exposure: **http://www.health.govt.nz/publication/environmental-case-management-lead-exposed-persons**

TOXINZ: **http://www.toxinz.com/Spec/2991465**

References

1. Uptodate, *Adult lead poisoning* 2016, Wolters Kluwer.
2. Ministry of Health, *Communicable Disease Control Manual*. 2012, Ministry of Health: Wellington.
3. Ministry of Health, *The Environmental Case Management of Lead-exposed Persons Guidelines for Public Health Units.* 2012, Ministry of Health: Wellington.
4. Environmental Health Indicators Programme, *National Hazardous Substances and Lead Notifications Report.* 2015, Centre for Public Health Research, Massey University: Wellington.
5. Fowles, J. and E. Silver, *A screening-level risk assessment of petrol exposures in New Zealand.* 2015, Institute of Environmental Science and Research.
6. Uptodate, *Childhood lead poisoning: Clinical manifestations and diagnosis* 2016, Wolters Kluwer.
7. TOXINZ, *Lead Poisoning*. 2016.
8. *Health Act 1956 (NZ)*.
9. Department of Labour, *Guidelines for the Medical Surveillance of Lead Workers 2nd ed.* 2010, Department of Labour: Wellington.

Lead image: Alchemist-hp 2010. Electrolytically refined pure (99.989 %) superficially oxidized lead nodules and a high purity (99.989 %) 1 cm3 lead cube for comparison. https://commons.wikimedia.org/wiki/File:Lead_electrolytic_and_1cm3_cube.jpg Accessed 20/6/2016

DISEASE NOTIFICATION – HOW YOUR GENERAL PRACTICE CAN HELP

In 2013 Regional Public Health launched the *Public Health Disease Notification Manual* to assist in the disease notification process.

Updates for this manual are located at **http://www.rph.org.nz**

To enable our staff to promptly initiate disease follow up we need your help in the following ways:

1. Inform your patient of the illness they have been diagnosed with or exposed to and that public health staff may be in contact.
2. Notify Regional Public Health of the disease within a timely fashion (after the case has been informed) - by phone for urgent notifications (as soon as you are aware), or by faxing a case report form for non-urgent (within one working day). You can find a list of urgent vs. non-urgent notifications on the Regional Public Health website under Health Professionals > Notifiable Diseases.
3. Complete all sections of the form, especially:
   - work/school/early childhood centre information
   - name of parent or guardian for a child under 16 years old.

The 3D HealthPathways includes a pathway on reporting notifiable diseases: **http://3d.healthpathways.org.nz**

WHAT ARE YOU REPORTING?

THREE MONTHS OF NOTIFIABLE CASES IN THE HUTT VALLEY, WAIRARAPA AND WELLINGTON

Table 1. Notifiable cases in the Hutt Valley, Wairarapa and Wellington 1/3/2016 – 31/5/2016.

Notifiable Condition	Number of confirmed cases (with additional 'probable' cases in brackets)			
	Hutt Valley	Capital and Coast	Wairarapa	Totals
Campylobacteriosis	37	70	7	114
Chikungunya fever		3		3
Cryptosporidiosis	3	8	5	16
Dengue fever	2	7		9
Gastroenteritis	2 (5)	1 (19)	0 (4)	31
Giardiasis	12	38	5	55
Hepatitis A		2		2
Hepatitis B	1			1
Hepatitis C			1	1
Invasive pneumococcal disease	2	9	1	12
Legionellosis	2	3	1	6
Leptospirosis		1		1
Meningococcal disease		1		1
Paratyphoid fever		1	1	2
Pertussis	0 (1)	21 (11)		33
Salmonellosis	9	10	3	22
Shigellosis	1	1 (1)		3
Taeniasis		1		1
Tuberculosis disease		3 (1)		4
VTEC/STEC infection	2	2		4
Yersiniosis	4	27		31
Zika virus		2 (1)		3
Totals	**77 (6)**	**211 (33)**	**24 (4)**	**355**

Notes

- No significant commonalities were confirmed for the 114 campylobacter cases.
- Two of the three cases of Chikungunya fever were thought to have acquired the infection in Fiji, and the remaining case is thought to have acquired the infection in India.
- All cases of dengue fever had travelled to high risk countries during incubation periods. Countries included: Papua New Guinea, Solomon Islands, Indonesia, Cambodia, and Samoa.
- Confirmed and probable cases of Zika virus also had international travel during their incubation periods; in Samoa (also with a probable concurrent dengue fever infection), Tonga and Brazil.

- The two cases of paratyphoid fever had potential exposures in Thailand, and Indonesia respectively, with a total of nine contacts screened and found to be negative for the infection.
- Possible sources identified for giardia infections included drinking roof-collected rainwater, and exposure at Early Childhood Education centres (ECEs).
- VTEC/STEC cases had identified risk factors including, consumption of large amounts of raw vegetable and fruit smoothies, and animal contact. One woman aged in her 20s was hospitalised requiring dialysis.
- The two cases of hepatitis A were both in the same family who had recently returned from living in Africa.
- Possible sources identified for cases of cryptosporidiosis included handling farm chickens and other animals, river swimming, and overseas exposures.
- The case of meningococcal disease was a woman aged in her 60s with immune suppression. *Neisseria meningitidis* sero group B was identified.
- Probable sources identified for legionella cases were the use of potting mix.
- Outbreaks investigated during the three months included a gastroenteritis outbreak, and an influenza outbreak at an ECE.

Sources

1. ESR. Episurv database of notifiable conditions. Accessed 20/6/2016.
2. Regional Public Health case notes and surveillance records.

CORRECTION TO THE PUBLIC HEALTH POST (APRIL EDITION)

The previous edition of the Public Health Post (Issue 25 - April 2016) contained an error in the table with relation to the number of notifications of illness for the Wairarapa and Wellington regions.

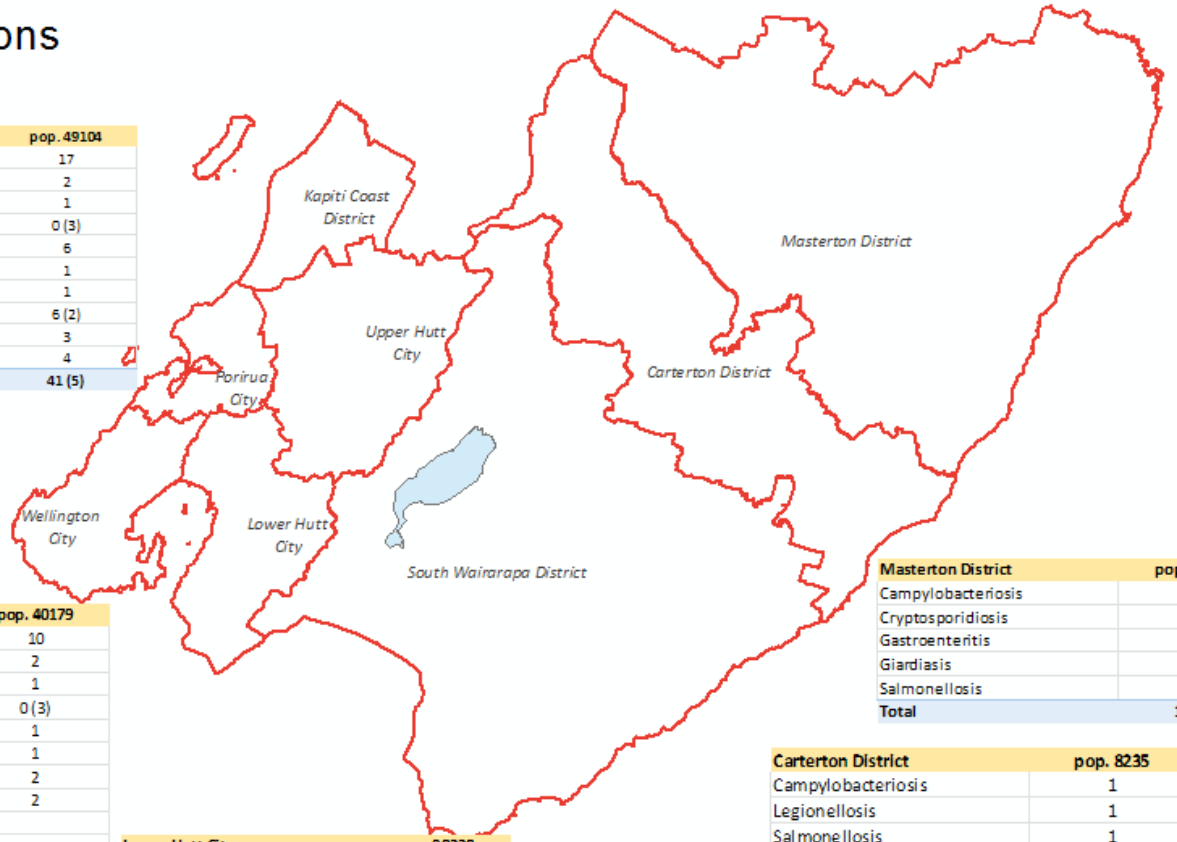
The table headings were transposed. Therefore, the number of cases of illness listed in the table for the Wellington region are in fact the figures for the Wairarapa region, and vice versa. We apologise for any confusion this may have caused.

Regional Public Health Notifications

1st March 2016 to 31st May 2016

Porirua City	pop. 51717
Campylobacteriosis	7
Chikungunya fever	1
Cryptosporidiosis	2
Dengue fever	3
Gastroenteritis	1 (1)
Giardiasis	2
Invasive pneumococcal disease	3
Meningococcal disease	1
Paratyphoid fever	1
Pertussis	6
Rheumatic fever	
Salmonellosis	1
Tuberculosis disease	2
Tuberculosis infection	
Yersiniosis	1
Total	**31 (1)**

Kapiti Coast District	pop. 49104
Campylobacteriosis	17
Cryptosporidiosis	2
Dengue fever	1
Gastroenteritis	0 (3)
Giardiasis	6
Invasive pneumococcal disease	1
Legionellosis	1
Pertussis	6 (2)
Salmonellosis	3
Yersiniosis	4
Total	**41 (5)**



Wellington City	pop. 190959
Campylobacteriosis	46
Chikungunya fever	2
Cryptosporidiosis	4
Dengue fever	3
Gastroenteritis	0 (15)
Giardiasis	30
Hepatitis A	2
Invasive pneumococcal disease	5
Legionellosis	2
Leptospirosis	1
Pertussis	9 (9)
Rheumatic fever	
Salmonellosis	6
Shigellosis	1 (1)
Taeniasis	1
Tuberculosis disease	1 (1)
Tuberculosis infection	
VTEC/STEC infection	2
Yersiniosis	22
Zika virus	2
Total	**139 (27)**

Upper Hutt City	pop. 40179
Campylobacteriosis	10
Cryptosporidiosis	2
Dengue fever	1
Gastroenteritis	0 (3)
Giardiasis	1
Invasive pneumococcal disease	1
Legionellosis	2
Salmonellosis	2
Tuberculosis disease	
Tuberculosis infection	
Yersiniosis	1
Total	**20 (3)**

Lower Hutt City	pop. 98238
Campylobacteriosis	27
Cryptosporidiosis	1
Dengue fever	1
Gastroenteritis	2 (2)
Giardiasis	11
Hepatitis B	1
Invasive pneumococcal disease	1
Listeriosis	
Pertussis	0 (1)
Salmonellosis	7
Shigellosis	1
Tuberculosis disease	
Tuberculosis infection	
VTEC/STEC infection	2
Yersiniosis	3
Total	**57 (3)**

Masterton District	pop. 23352
Campylobacteriosis	3
Cryptosporidiosis	5
Gastroenteritis	0 (3)
Giardiasis	4
Salmonellosis	1
Total	**13 (3)**

Carterton District	pop. 8235
Campylobacteriosis	1
Legionellosis	1
Salmonellosis	1
Total	**3**

South Wairarapa District	pop. 9528
Campylobacteriosis	3
Gastroenteritis	0 (1)
Giardiasis	1
Hepatitis C	1
Invasive pneumococcal disease	1
Paratyphoid fever	1
Salmonellosis	1
Total	**8 (1)**

Notes:

1. Population data from Statistics New Zealand 2013 Census 'usually resident population'.
2. Tables present the number of 'confirmed cases', with additional 'probable cases' in brackets.
3. Notification data from Episurv database. ESR, 20/6/2016.

Figure 1. Notifiable cases in the Hutt Valley, Wairarapa and Wellington 1/3/2016 – 31/5/2016, tabulated by territorial authority.

NEEDLE EXCHANGE SERVICES - A CLEAN FIT

Dr Peter Murray, Public Health Registrar, Regional Public Health
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Image credit: Debora Cartagena, USCDCP 2015. Public Domain Images.

Key Messages

- Needle/syringe exchange programmes are a proven and cost-effective public health strategy that reduces the risk of blood-borne virus transmission.
- New Zealand has a needle/syringe exchange programme governed by the Health (Needle and Syringes) Regulations 1998.
- The Drugs and Heath Development Project is the key organisation which provides needle/syringe exchange and support services for people who inject drugs in the greater Wellington and Wairarapa region.

Needle/syringe exchange programmes

Blood-borne virus (BBV) spread between people who inject drugs (PWID) is a key public health issue.[1,2] The major risk factor for spreading BBV amongst PWID is through the sharing of needles, syringes and other paraphernalia.[1] Access to sterile equipment, such as through a needle syringe exchange programme (NSEP), has been one of the key public health strategies adopted to reduce BBV spread.[1-3]

NSEP is known to be an effective and cost-saving means for reducing spread of BBV and reducing risky injecting behaviors amongst the PWID population.[2-6] Research has demonstrated it has the greatest impact in reducing HIV.[2,4] It has been less efficacious in reducing HCV and HBV spread, possibly due to the higher prevalence of these diseases in this population.[2,4] There is no evidence that NSEPs increase the number of PWIDs; rather they may reduce the frequency of injections.[6,7]

NSEP in New Zealand

NSEP was established in New Zealand in the late 1980s in response to the global HIV/AIDS epidemic.[2] The programme is currently governed in New Zealand by the Health (Needle and Syringes) Regulations 1998. Under these regulations, needles/syringes can be sold by a number of providers: pharmacists, approved medical practitioners and other authorised organisations (e.g. non-governmental organisations). These providers also have an obligation to dispose of returned used equipment. The regulations also make the inappropriate selling and disposal of needles/syringes an offence. Under the regulations, the Medical Officer of Health plays a role in assessing and approving certain NSEP sites and providers.

Since its establishment, NSEP has proved very effective in maintaining low rates of HIV in the New Zealand PWID population and reducing new HIV and HCV infections.[2] Research has also demonstrated it as cost-effective; with every $1 spent bringing an estimated $20.00 in benefits through reduced potential HIV/HCV cases.[2] Given that HIV prevalence remains low in the PWID population in New Zealand, reducing the spread of HCV has become a key focus for NSEP.[2]

Regional Public Health and NSEP

Within the Wellington region, the NSEP is mainly operated through local pharmacies and the Drugs and Heath Development Project (DHDP). Regional Public Health is involved in assessing and approving the DHDP NSEP in the greater Wellington and Wairarapa region.

The DHDP is the leading NSEP and PWID support organisation in the Wellington region. They have drop-in centers and after-hours electronic dispensers for the purchase of needles, syringes and other paraphernalia. The DHDP also provides advice and education on safe injecting practices, managing detoxification, health issues facing the PWID population, available support services and

information on PWID rights. If you have a patient who would like more information on this service, they are located at:

Wellington - 233a Willis Street, Wellington
Phone: (04) 382 8404

Wairarapa - 17a Hope Street, Masterton
Phone: (04) 370 8259

More information on this service and a list of pharmacies that are also part of the NSEP can be found at: **http://www.drugsproject.co.nz/**

References

1. Stancliff, S., et al., *Syringe access for the prevention of blood borne infections among injection drug users.* BMC public health, 2003. **3**(1): p. 1.
2. Aitken, C., *New Zealand needle and syringe exchange programme review.* 2002, The Centre for Harm Reduction.
3. WHO, *Effectiveness of sterile needle and syringe programming in reducing HIV/AIDS among injecting drug users.* 2004, WHO.
4. Bennett, J.E., R. Dolin, and M.J. Blaser, *Mandell, Douglas, and Bennett's principles and practice of infectious diseases.* 8th edition ed. 2015: Elsevier Health Sciences.
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6. Sherman, S.G., et al., *Consequences of a restrictive syringe exchange policy on utilisation patterns of a syringe exchange program in Baltimore, Maryland: Implications for HIV risk.* Drug and alcohol review, 2015. **34**(6): p. 637-644.
7. Bluthenthal, R.N., et al., *The effect of syringe exchange use on high-risk injection drug users: a cohort study.* AIDS, 2000. **14**(5): p. 605-611.

Needle image: Debora Cartagena, USCDCP 2015. Public Domain Images. http://www.public-domain-image.com/free-images/science/medical-science/distal-tip-of-an-empty-syringe-revealing-the-metallic-needle-with-its-blue-plastic-proximal.jpg Accessed 20/6/2016.

PUBLIC HEALTH ALERTS

Regional Public Health communicates public health alerts to primary care practices by fax and by email. These communications often contain information that needs to be urgently taken on board by general practitioners and primary care nurses.

Please contact Regional Public Health on (04) 570 9002 if you have not been receiving alerts, or to check and confirm that we have your correct details.

If you are not yet receiving alerts by email, and would like to, then you can provide your email address via phoning the number above.

Ordering pamphlets and posters:

To order any Ministry of Health resources, please contact the Health Information Centre on (04) 570 9691 or email **laurina.francis@huttvalleydhb.org.nz**

For enquiries regarding the Public Health Post, please contact Dr Jonathan Kennedy, medical officer, Regional Public Health, by email **jonathan.kennedy@huttvalleydhb.org.nz** or by phone **(04) 570 9002**. Alternatively contact one of the regional medical officers of health: **Dr Jill McKenzie, Dr Craig Thornley, Dr Annette Nesdale and Dr Stephen Palmer.**

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