

# Occupational Dermatitis in New Zealand

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- The National Occupational Health and Safety Advisory Committee : “The burden of occupational disease and injury in NZ: Technical Report” 2004
- They found 8 publications related to occupational skin conditions, only 4 of which were about contact dermatitis ( the other 4 were about warts (2), chilblains, and blister beetle dermatosis )
- I found one more paper.

- Of these 5 papers on occupational dermatitis, 2 were questionnaire studies which identified the prevalence of self reported dermatitis:
  - one in boat builders,
  - another in dentists

- Another looked at 16 males with occupational dermatitis due to epoxy resins
- Another looked at 46 farmers investigated for contact dermatitis
- Another looked at occupational skin conditions ( including dermatitis ) presenting to a private dermatology practice over a 6 year period: (1987-1993)

- The NOHSAC paper tells us that in 6 years (1992-1998) there were 311 notifications for occupational skin disease ( including burns ) to NODS
- In a 9 year period (1994-2003) there were about 560 paid ACC claims for occupational dermatitis

.....so in a 5 yr period, that's:

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- 260 NODs ( incl burns )
- 310 ACC claims

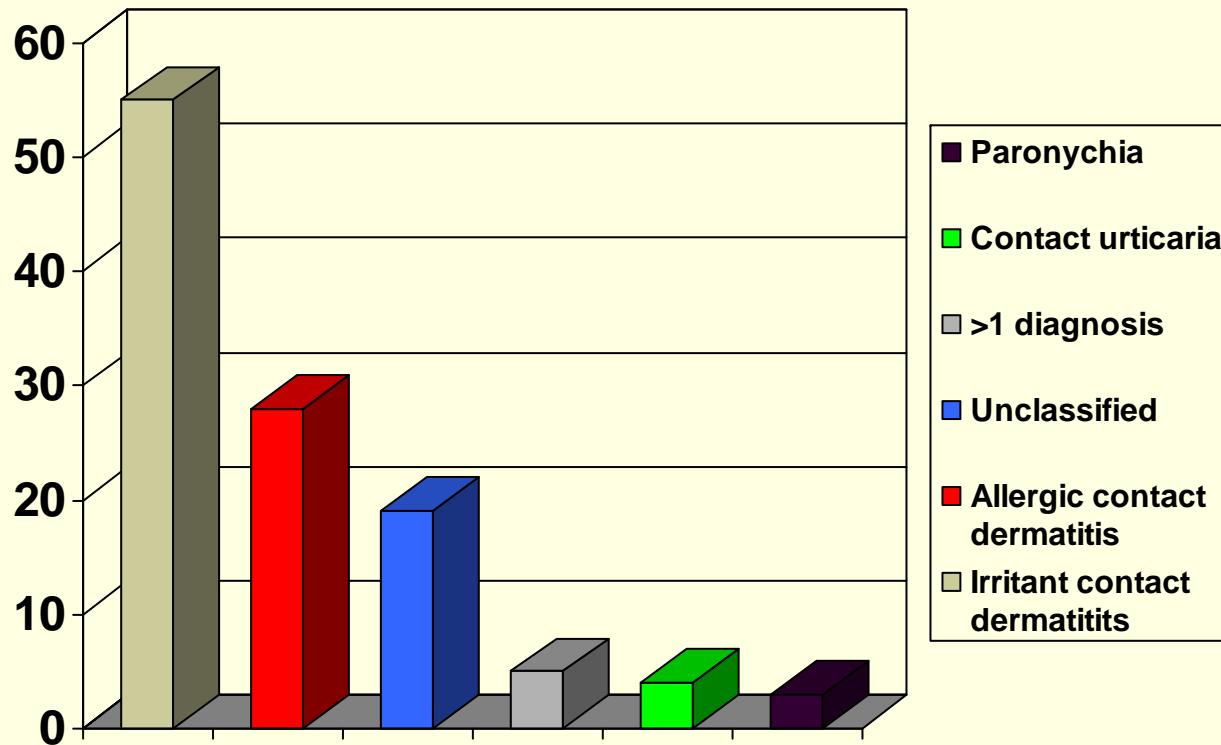
...and from all of this we've learned that:

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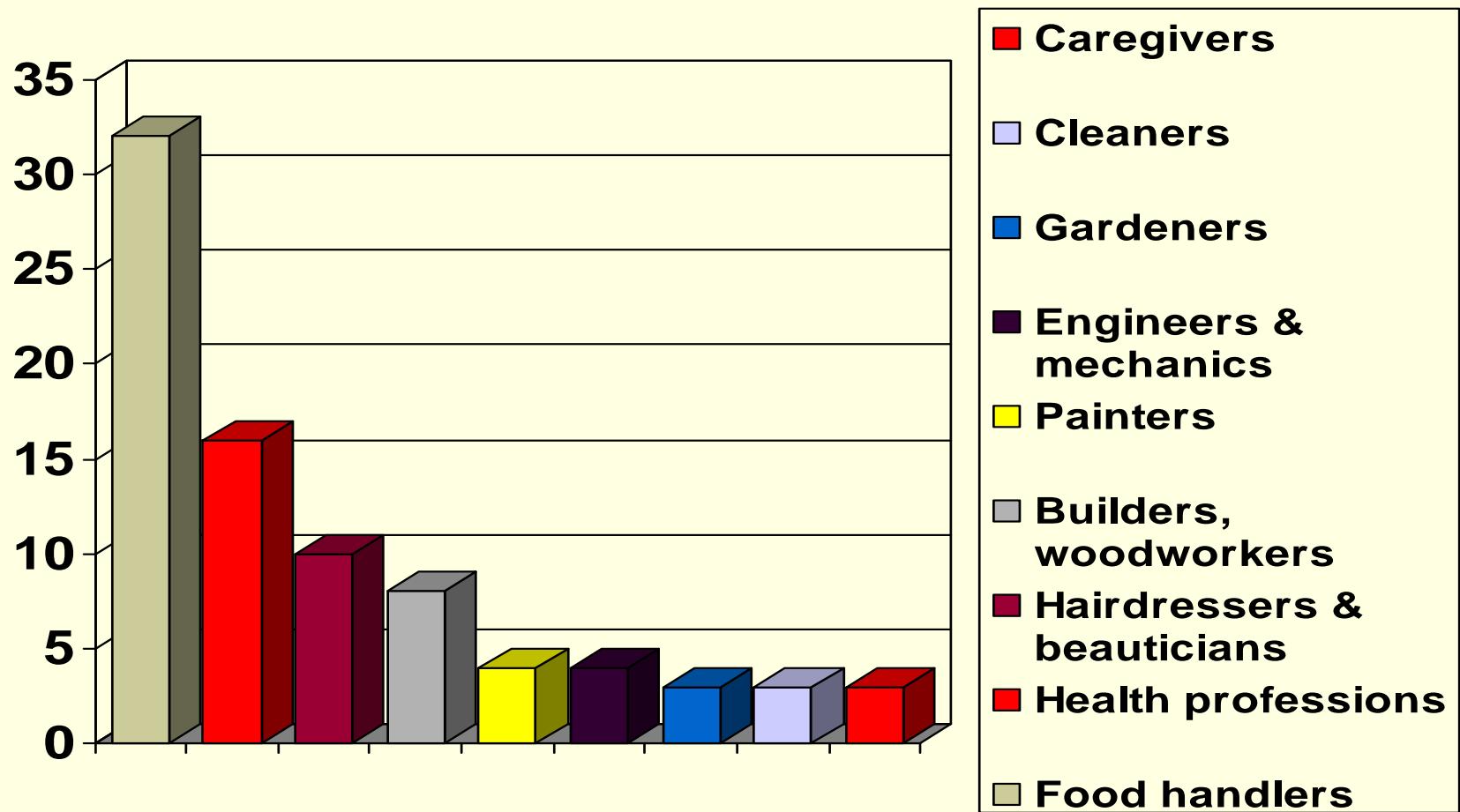
- Occupational irritant contact dermatitis is more common than allergic contact dermatitis
- Hairdressers, food handlers, and health care workers account for the majority
- And we've learned a bit about dermatitis in farmers and boat builders

# My data for the 5 years: (2003-2008)

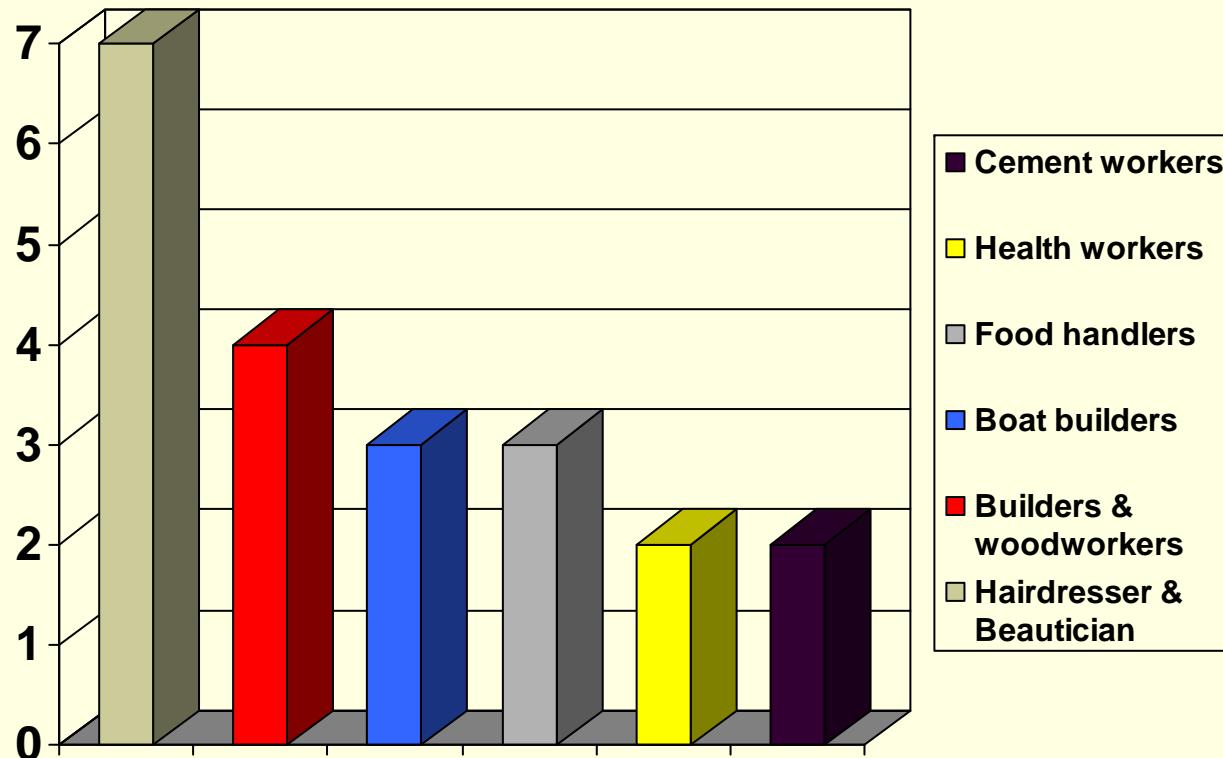
105 cases



# My data for the 5 years: (2003-2008)

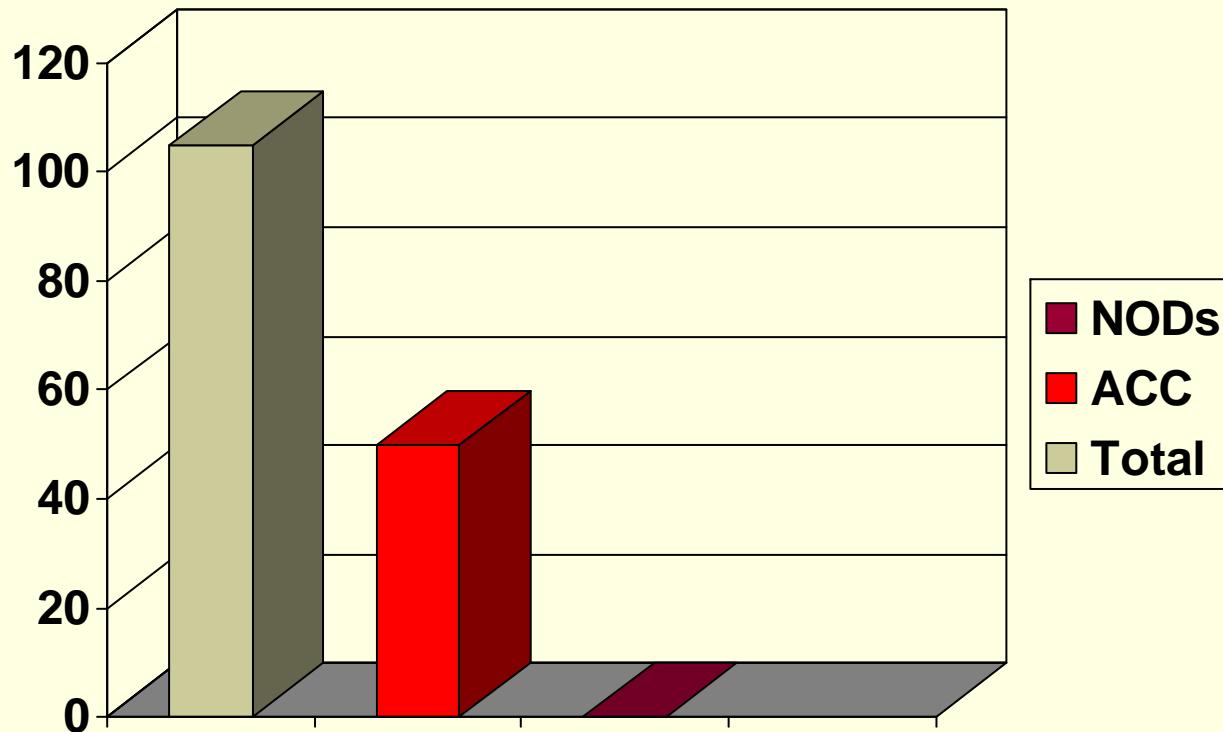


# Contact allergic dermatitis – my data

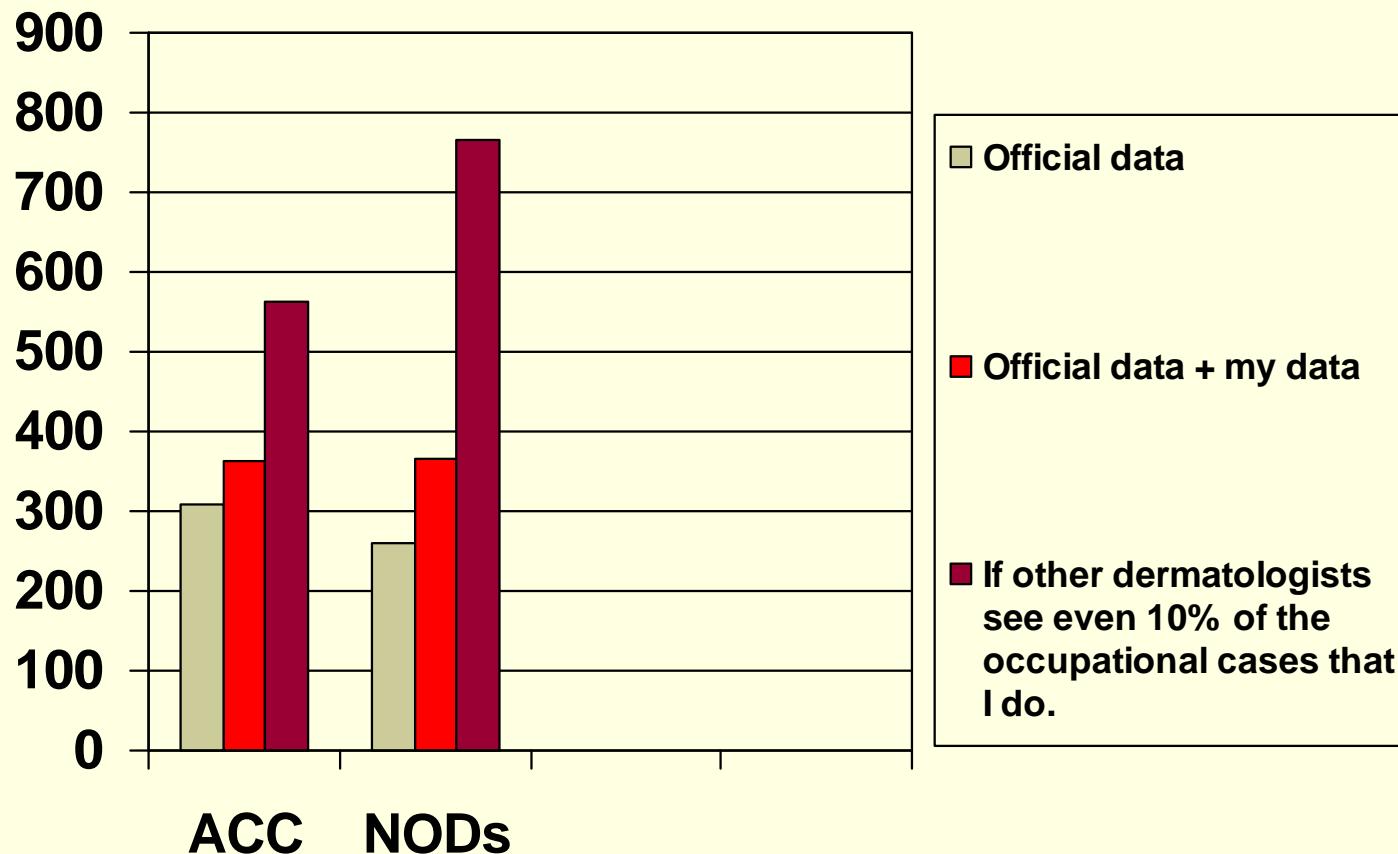


# My data for the 5 years: (2003-2008)

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# ....some wild speculation



# A chap with a rash...

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- Mr C makes animal feed.
- He usually works as an “intake operator” but he covers for workers in the “pre mix room” when they are on holiday ( this amounts to about a week every 2 months ).
- He says he ONLY has a rash when he works in the pre mix room.
- The pre mixes are amino acids, minerals, flavourings, grains, pharmaceuticals, and vitamins -they vary from batch to batch. He scoops them into a bucket which he tips into the machine, and then he goes into another room and does computery things

- Mr C has long sleeved overalls, but it's very dusty in the pre mix room and the stuff gets down his sleeves.
- He has a problem with generalised hyperhidrosis ( ie he is very sweaty ), and for this reason he is always wiping his face.

- The rash usually starts on the flexor aspect of the forearm, and then affects the anterior neck, and then the eyelids swell up.
- He says that it starts with welts and these turn into eczema.
- He has no personal or family history of atopic conditions.

- When first seen he had discoid eczema affecting the forearms, the anterior upper thighs, calves, and behind the knees.
- Seemed an odd distribution for a contact allergy!
- He said that this was the first time he had ever had rash on the lower limbs. It was usually forearms, neck, face.

- Given the clear temporal association with the pre mix room his employer was advised that he could not work there.
- .....then his rash turned up again, despite not working in the pre mix room. So, we proceeded to investigate

- He arrived with a VERY large box full of feed ingredients in resealable bags.
- This was accompanied by a very slightly smaller box of material safety data sheets.
- All substances were tested, unless they were deemed too irritating, and/or pointless ( eg sodium chloride )

# Patch test

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- Routine screen
- Wheat flour
- Rye flour
- Barley flour
- Pea flour
- Rice flour
- Maize
- Avrax
- Lucerne
- Choline chloride
- Yeasacc
- Vitamin E
- Elancoban
- Rumensin
- Golden flake
- Tylan 250
- Soya
- Monteban
- Apralan
- Copra

# Patch test

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- Methionine
- Biolysine
- Threonine
- Biomass
- Broll
- Milk powder
- Mecadox
- Raspberry flavour
- Apple flavour
- Cattle flavour
- Calf flavour

# Skin prick tests

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- Carried out for all patch test allergens except the routine screen
- Plus positive and negative controls

# Results

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- Patch tests negative at 48 and 96 hrs
- Skin prick tests: positive control 6 mm, choline chloride 10 mm

# Interpretation

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- The one occasion Mr C had had a reaction when NOT working in the pre mix room, he had been packing bags of choline chloride
- Rash affected forearms, neck and face; welts turned into eczema.
- Diagnosed **contact urticaria to choline chloride.**
- No previous reports of contact urticaria in literature; one report of positive patch test.

# What is choline chloride anyway?

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- (2-hydroxyethyl)trimethylammonium chloride
- ie a quaternary ammonium salt
- Sometimes called Vitamin B4
- Been used in humans for treatment of dementia and ataxia
- You can buy citrus flavoured choline chloride for human consumption off the internet.
- You can buy it for animal consumption from the Heng Feng Be-Long Choline Factory
- Minor irritant in animal and human studies.



In poultry choline is essential for yolk production and it prevents 'perosis' – slipping of the Achilles tendon



In pigs one gets a better conception rate, and fewer piglets with leg disorders



And in cows choline supplements result in better milk production

# Another chap....

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- Mr C2 works at the same place; he is an engineer.
- One Saturday he stripped down a machine in the dog biscuit area, then finished the job on Monday, and on Tuesday he developed a rash on the flexor forearms, V of the neck, and the right upper and lower eyelids.
- The rash improved
- 3 weeks later he was again in the dog biscuit area ( not working on the machine ) and the rash flared up.
- The rash settled down again

- Several weeks later he was back in the dog biscuit area – just talking for 10 minutes to the chap who was tipping stuff into the machine....and his rash flared up again ( V of neck and eyelids ).
- No history of welts
- Adult onset asthma; no prior history of rashes.

# Patch test

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- Routine screen
- Yellow oxide 420
- Yellow oxide 960/4
- Brown oxide
- Chrome green oxide
- Ponceau ( red color )
- Vitamin E
- Wheat
- Ovine meal
- Pre mix vitamins
- Inulin
- Pea
- Poultry meal
- Meat meal
- Molasses
- Calf flavour
- Broll
- Premulac
- Golden flake
- Maize

- Feather meal
- Barley
- Montebran
- Soyameal
- Yeassac
- Elancoban
- Apple flavour
- Choline chloride
- Bovatec
- Aviax

# Results

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- Ponceau neg at 48 hours, + at 96 hr
- All others negative
- This confirmed the patient's suspicions. He had checked with the worker in the dog biscuit room and found that *ponceau* had been added on each of his last 2 visits ( and would have been present in the machine when he had stripped it down )

- This red dye was an incredibly fine powder, like toner cartridge powder.
- One could easily conceive of his face and V of neck being exposed, even though he was standing a couple of meters away from the fellow tipping the stuff into the machine
- I concluded that Mr C2 had a **contact allergic dermatitis due to ponceau**, despite the small patch test reaction

# Why am I telling you all this....?

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- Occupational contact dermatitis cases can involve a lot of detective work
- Most dermatologists only patch test a routine screen; failing to test additional allergens will miss about 30% of relevant positive results.
- Some dermatologists dont patch test at all. Very few do skin prick tests

- Occupational dermatitis in NZ is under reported, under-recognised, and under-investigated
- ...and under-studied