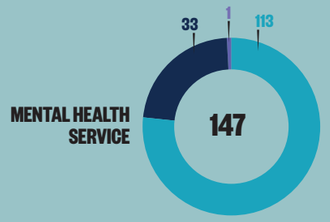
MEDICINES SAFETY IN CHILDREN

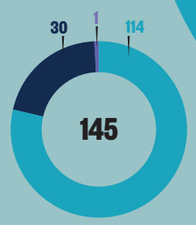
Children in hospital are estimated to be exposed to potential harm related to their medicines three times more often than adults. Here, we look at the types of medicines-related safety incidents that are reported in children and where and when they happen.

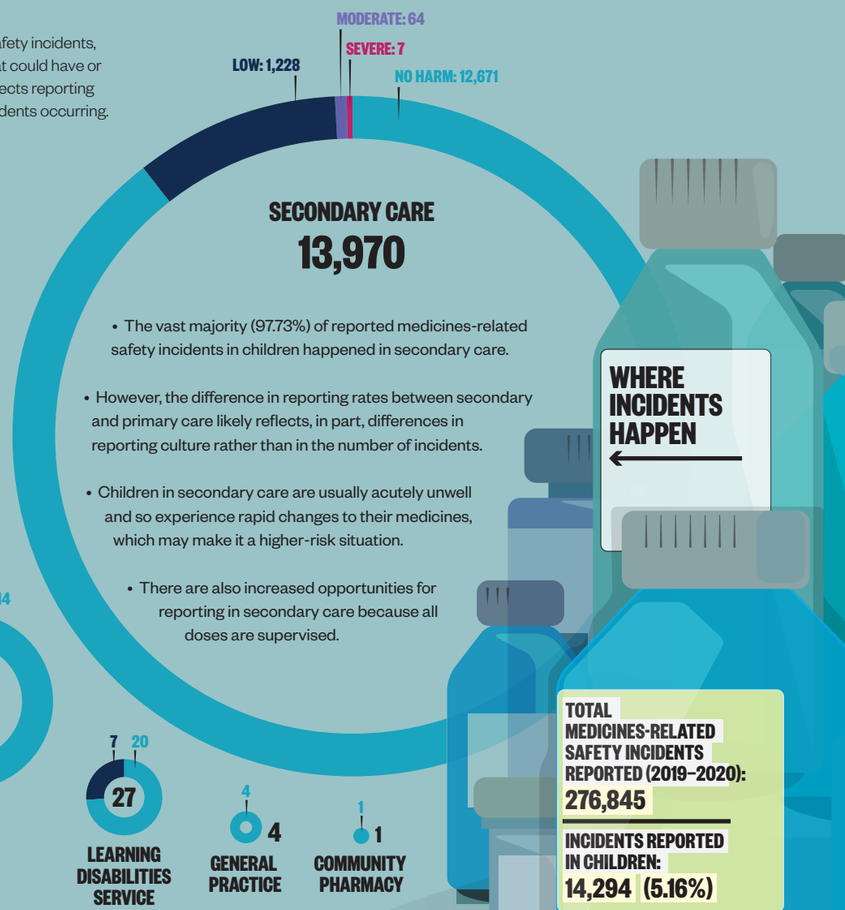
BY DAWN CONNELLY AND HARRIET PIKE

National Reporting and Learning System (NRLS)
The NRLS is a voluntary reporting system for patient safety incidents, defined as any unintended or unexpected incidents that could have or did lead to harm. The number of incidents reported reflects reporting culture, and is not necessarily the actual number of incidents occurring.

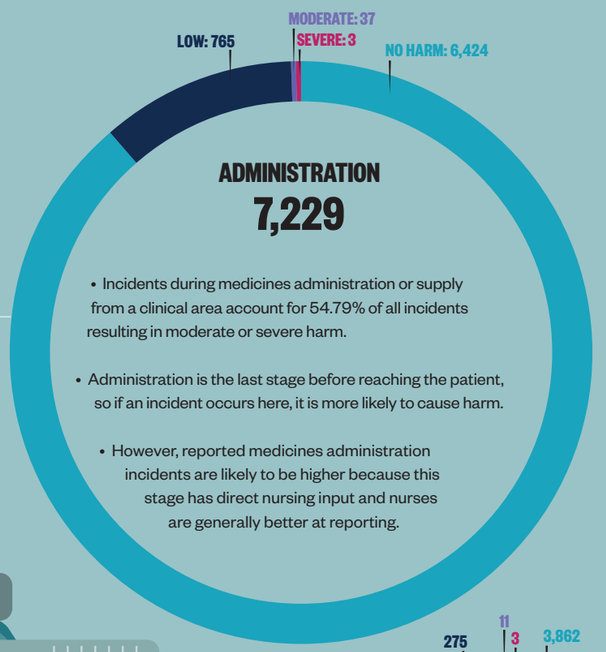
Definitions of degree of harm
- No harm
- Low (minimal harm — patient(s) required extra observation or minor treatment)
- Moderate (short-term harm — patient(s) required further treatment, or procedure)
- Severe (permanent or long-term harm)

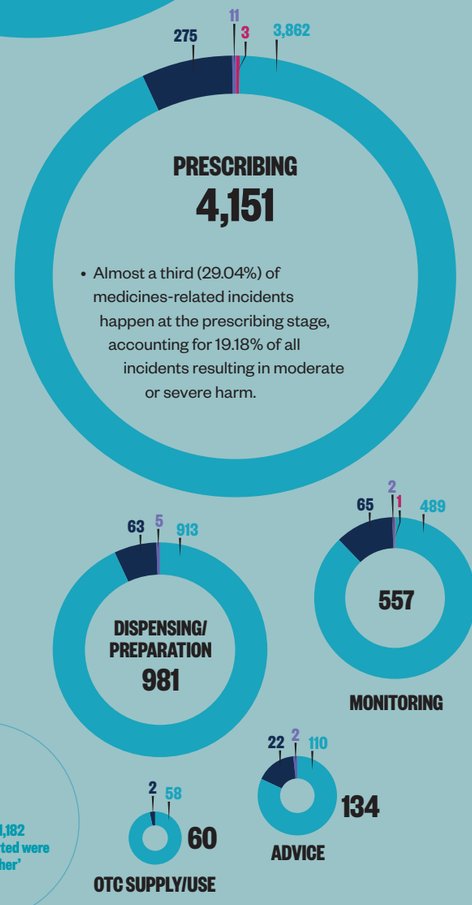






90.41% of medicines-related safety incidents resulted in no harm; 9.08% resulted in low harm; 0.46% resulted in moderate harm; 0.05% resulted in severe harm and 0.00% resulted in death



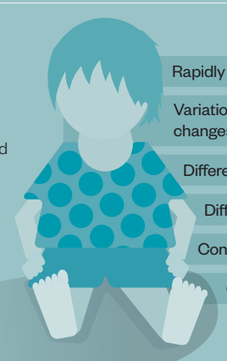


1,182
The remaining 1,182 incidents reported were categorised 'other'

NOT SMALL ADULTS

There are some fundamental differences between children and adults that mean prescribing for children is not the same as prescribing for small adults.

10X
Paediatric inpatients in the same ward can vary tenfold in their bodyweight.

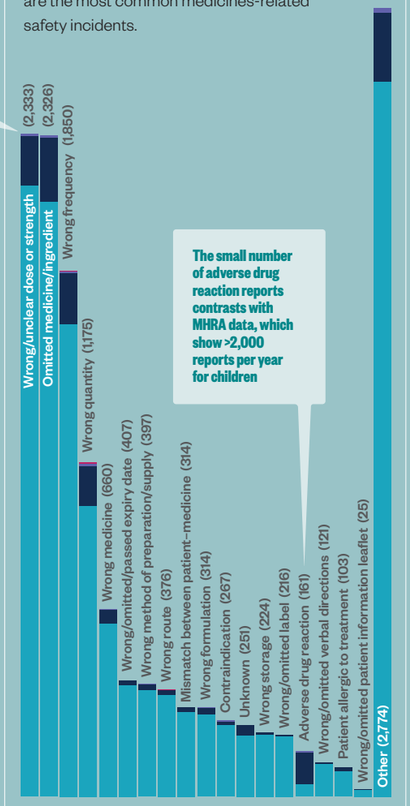


- Rapidly changing, highly variable size and weight
- Variation in body structure and function, leading to changes in pharmacokinetics and pharmacodynamics
- Different side effects (e.g. growth suppression)
- Different disease states and prematurity
- Continuous development
- Changes in cognition

Tenfold medication errors are a particular concern in children

TYPES OF INCIDENTS

Wrong or unclear dose or strength, omitted medicine and wrong frequency are the most common medicines-related safety incidents.



The small number of adverse drug reaction reports contrasts with MHRA data, which show >2,000 reports per year for children

CAUSES OF INCIDENTS

Several factors that are specific to prescribing in children contribute to medicines safety incidents.

Individualised dosing: Doses or intervals not altered as children grow; small or large for age children not recognised; errors in calculations based on age, weight or body surface area; misplacement of decimal points; confusion around dosing equations; errors in weighing children.
Off-label or unlicensed prescribing: Lack of clear dosage information; multiple or unclear reference standards; trial and error dosage strategies.
Medicines formulations: Availability of appropriate presentations for children; incorrect dosage conversions: inappropriate prescribing in mL when multiple solution strengths are available; further manipulation to aid adherence.
Communication: Difficulties in accurate medicines reconciliation; inadequate communication of prescribing decisions and dose changes between care settings and to parents.
Experience of paediatrics: Lack of familiarity with doses and formulations for children and infants; not recognising differences in prescribing for children.

Sources: Data are for incidents in England reported to the National Reporting and Learning System between 1 April 2019 and 31 March 2020. Children are aged between 2 days and 17 years at the time of the incident. *BMJ Open* 2019;9:e028680; *JAMA* 2001;285:2114–20; *Archives of Disease in Childhood* 2020;105:e3. **Editorial advisers:** Andy Fox, consultant pharmacist medicines safety and deputy chief pharmacist, University Hospital Southampton NHS Foundation Trust; Daniel B Hawcutt, senior lecturer in paediatric pharmacology at the University of Liverpool and honorary consultant in paediatrics at Alder Hey Children's Hospital.