Female genital mutilation in children presenting to Australian paediatricians

Yvonne Zurynski,1,2 Amy Phu,1,2 Premala Sureshkumar,1,2 Sarah Cherian,3,4 Marie Deverell,1,2 Elizabeth J Elliott,1,2 for Australian Paediatric Surveillance Unit Female Genital Mutilation Study Steering Committee

ABSTRACT
Objective The WHO reports that female genital mutilation/cutting (FGM/C) is an ancient cultural practice prevalent in many countries. FGM/C has been reported among women resident in Australia. Our paper provides the first description of FGM/C in Australian children.

Design Cross-sectional survey conducted in April–June 2014.

Setting Paediatricians and other child health specialists recruited through the Australian Paediatric Surveillance Unit were asked to report children aged <18 years with FGM/C seen in the last 5 years, and to provide data for demographics, FGM/C type, complications and referral for each case.

Participants Of 1311 eligible paediatricians/child health specialists, 1003 (76.5%) responded.

Results Twenty-three (2.3%) respondents had seen 59 children with FGM/C and provided detailed data for 31. Most (89.7%) were identified during refugee screening and were born in Africa. Three (10.3%) were born in Australia: two had FGM/C in Australia and one in Indonesia. All parents were born overseas, mainly Africa (98.1%). Ten children had WHO FGM/C type I, five type II, five type III and six type IV. Complications in eight children included recurrent genitourinary infections, menstrual, sexual, fertility and psychological problems. Nineteen children (82.6%) were referred to obstetrics/gynaecology: 16 (69.9%) to social work and 13 (56.5%) to child protection.

Conclusions This study confirms that FGM/C is seen in paediatric clinical practice within Australia. Paediatricians need cultural awareness, education and resources to help them identify children with FGM/C and/or at risk of FGM/C, to enable appropriate referral and counselling of children, families and communities to assist in the prevention of this practice.

INTRODUCTION
Female genital mutilation/cutting (FGM/C) is an ancient cultural practice that predates the Bible and the Koran and has no religious grounds;1 however, the WHO recognises that ‘…practitioners often believe the practice has religious support’.2 The WHO defines FGM/C as ‘the partial or total removal of the external genitalia, or other injury to the female genital organs for non-medical reasons’.3 FGM/C procedures range from ‘nicking’ or ‘pricking’ the prepuce to complete removal of the clitoris and labia, and infibulation, when the vaginal opening is narrowed by cutting and suturing together the inner and outer labia, with or without removal of the clitoris.4 3 A classification system developed by the WHO identifies four distinct types of FGM/C (figure 1).5 6 FGM/C violates the United Nations (UN) Charter of Human Rights, the UN Charter of Women’s Rights, the Charter of the Rights of the Child and the UN Charter of Rights of the African Child.7–10

FGM/C is practised globally, predominantly in Africa, the Middle East and Asia. A prevalence of 70% or more is reported among women in some African countries including Somalia, Egypt, Sierra Leone, Sudan, Mali, Eritrea and Ethiopia.11 There are no medical or health indications for FGM/C but it forms part of traditional rituals for many cultures. Immediate complications of FGM/C include bleeding, pain, genitourinary infections and significant psychological trauma.12–14 Long-term complications include urinary tract, obstetric, gynaecological, psychological and sexual problems.13–14

UNICEF estimates that at least 200 million girls and women worldwide have undergone FGM/C.4 8 10 11 FGM/C is usually performed in girls

What is already known on this topic?

▸ UNICEF estimates that 200 million girls and women have undergone female genital mutilation/cutting (FGM/C) and the procedure is usually done in girls aged 1 month to 15 years.
▸ FGM/C has been reported among immigrant women living in developed countries.
▸ There is only one report of FGM/C in children living in developed countries—a study of children in the UK showed that type IV FGM/C was the most common.

What this study adds?

▸ Our paper provides the first report of FGM/C in Australian children.
▸ All four types of FGM/C were seen in the children identified by our study, with type I the most common.
▸ Our study highlights that child health services need to be included in any response to end the practice of FGM/C and child health professionals need education, resources and referral pathways for children with FGM/C.

CrossMark

aged between 1 month and 15 years; however, prevalence data in this age group have been scarce until a recent report, which showed high prevalence rates among girls aged under 14 years in Gambia (56%), Mauritania (54%) and Indonesia (∼50%).

The prevalence of FGM/C among women and girls living in developed countries such as the UK, USA, Canada and Australia is unknown. FGM/C is usually organised privately by families, often outside the health system. Information about FGM/C, even when it is detected, is not routinely coded in paediatric medical records, and there is no FGM/C registry in Australia. In contrast, in the UK, FGM/C is coded in medical records to support mandatory centralised reporting into the FGM

**Type I**: Partial or total removal of the clitoris and/or the prepuce (clitoridectomy). When it is important to distinguish between the major variations of type I mutilation, the following subdivisions are proposed:

- **Type Ia**: Removal of the clitoral hood or prepuce only;
- **Type Ib**: Removal of the clitoris with the prepuce.

**Type II**: Partial or total removal of the clitoris and the labia minora, with or without excision of the labia majora (excision). When it is important to distinguish between the major variations that have been documented, the following subdivisions are proposed:

- **Type IIa**: Removal of the labia minora only;
- **Type IIb**: Partial or total removal of the clitoris and the labia minora;
- **Type IIc**: Partial or total removal of the clitoris, the labia minora and the labia majora.

**Type III**: Narrowing of the vaginal orifice with creation of a covering seal by cutting and appositioning the labia minora and/or the labia majora, with or without excision of the clitoris (infibulation). When it is important to distinguish between variations in infibulations, the following subdivisions are proposed:

- **Type IIIa**: Removal and apposition of the labia minora
- **Type IIIb**: Removal and apposition of the labia majora

**Type IV**: All other harmful procedures to the female genitalia for non-medical purposes, for example: pricking, piercing, incising, scraping and cauterisation.

**Figure 1** WHO classification of female genital mutilation/cutting (FGM/C) typology.6

Enhanced Dataset, which reported 5702 newly recorded cases including 106 girls aged <18 years over a 12-month period. A recent study from a safeguarding clinic in London identified girls resident in the UK in whom the circumstances of the FGM/C procedure were known. In 71% of these girls, there was evidence of medicalisation of FGM/C, including performance in a health setting, or involvement of health professionals, or use of antibiotics or anaesthesia. In 10 cases from the same study, the circumstances were known or suspected to be illegal, that is, FGM/C was thought to have been performed in the UK or the child had been taken overseas for FGM/C after 2003, when UK law changed to prevent this. WHO has condemned medicalisation of FGM/C, and laws in many countries forbid this, but girls may be taken overseas for FGM/C despite these laws. Recent legal proceedings for FGM/C, including a conviction in Sydney, highlight that FGM/C had been practised in Australia.

FGM/C is most often identified in the context of obstetric or gynaecological (O&G) care and most of the medical literature has focused on FGM/C in women rather than girls. Some women are unaware that they have had FGM/C, particularly if it was undertaken in infancy. Although FGM/C is relevant to all health professionals who look after girls and women, most lack knowledge about FGM/C. In our recent survey of Australian paediatricians, only 14.5% had attended any education about FGM/C. Less than 50% were aware of the FGM/C policy of the Royal Australasian College of Physicians Division of Paediatrics and Child Health (RACP-DPCH) or the RACP-DPCH clinical guideline on Genital Examination in Girls and Young Women, and only 22% knew of the WHO FGM/C classification.

FGM/C has been reported in women resident in Australia, predominantly immigrants from African countries. We report the first Australian data, among the first in the Western world, on FGM/C in children and adolescents aged <18 years seen by paediatricians and other child health specialists.

METHODS

We developed a survey asking about attitudes, knowledge and clinical practice related to FGM/C. Here, we report on children aged <18 years with FGM/C seen in the last 5 years and reported in this survey. For each case, paediatricians provided de-identified demographic details, type of FGM/C, complications, referrals and country where FGM/C was performed. Initials and date of birth were collected, but later deleted, after checking for duplicate reports. A pictorial depiction of the WHO FGM/C types was included in the survey.

Participants were recruited through the Australian Paediatric Surveillance Unit (APSU) in April–June 2014, when 1340 clinicians, mainly paediatricians (71%), were participating in APSU.
activities. Other specialists who work with children, for example, paediatric surgeons, psychiatrists, neurologists, urologists, etc also participate in the APSU and we refer to all as ‘paediatricians’. Surveys were sent by email (n=1140) or post (n=200); 29 paediatricians were on extended leave and were excluded. Paediatricians who did not respond within 2 weeks were sent three weekly reminders. Those who had not responded after this received a short follow-up survey asking only whether or not they had seen children aged <18 years with FGM/C in the last 5 years, and if so, how many.

Statistical analysis
Data were collected and managed using the Research Electronic Data Capture (REDCap). Descriptive statistics were used to analyse demographics and clinical features using the statistical software package IBM SPSS V22.

RESULTS
Of 1311 paediatricians, 497 responded. The remaining 814 received the short follow-up survey and 506 responded; a total of 1003 of 1311 (76.5%) responded. Twenty-three (2.3%) clinicians had seen at least one child with FGM/C in the last 5 years in their practice in Australia—59 cases in total. Eighteen reporting clinicians were paediatricians, and of these, 10 (55.5%) specialised either in child protection, refugee health or community medicine. Two psychiatrists, one O&G, one urologist and one surgeon also reported cases. Paediatricians working in refugee health clinics in major paediatric hospitals in Perth and Melbourne reported most cases (n=39). Detailed data were provided for 31 cases; however, not all details were complete for every case. Among the 31 cases, there were no duplicate reports.

Children were aged between 4.8 months and 17.6 years (median 10.7 years) when FGM/C was identified by the clinician (table 1). The majority (89.7%) were identified through refugee screening and were born in Africa, but three were born in Australia. All parents were born overseas (table 1). FGM/C was reportedly performed in Africa in 81.5%. FGM/C was not always performed in the country of birth. For example, of seven children born in Sudan, two had FGM/C in Malaysia, one in Eritrea. One child born in Australia had FGM/C in Indonesia (table 2).

All types of FGM/C were reported (table 3) with type I the most common (38.5%). In five cases (16.1%), the clinician chose a WHO classification that did not match the description they provided of the excision. Examples include excision of the clitoris and labia minora classified as type III rather than type II, and excision of the clitoris classified as type IV rather than type I.

Complications were reported in eight cases (25.8%): three had FGM/C type I, two type II and three type III (table 3). Details of complications were available in seven, and most commonly included unspecified urinary problems, dysuria, frequency, enuresis and periurethral bleeding (table 3). One adolescent with type III, had dysmenorrhea, vulvar vaginitis, vaginal erythema, sexual and fertility problems, chronic pain and psychological problems. Psychological problems were reported in only this case.

Information on referral was available in 25 cases. Most were referred to O&G (82.6%), social work (69.6%) and child protection services (56.5%). One child was referred for psychological counselling, one to a surgeon and another one to an enuresis service (table 2).

DISCUSSION
This is the first case series of Australian children and adolescents with FGM/C presenting to paediatricians and other child health specialists nationally. It is the second study to report children and adolescents with FGM/C in the developed world and the largest case series (n=59). Children presented with all four WHO types of FGM/C, type I being the most common. This is

Table 1 Characteristics of female genital mutilation/cutting (FGM/C) cases reported by Australian paediatricians

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No*</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at identification (years)</td>
<td>25</td>
<td>0–5: 2 (8.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5–10: 8 (32.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10–15: 11 (44.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15–18: 4 (16.0)</td>
</tr>
<tr>
<td>Country of birth of child</td>
<td>29</td>
<td>Kenya: 7 (24.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sudan: 7 (24.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Australia: 3 (10.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eritrea: 3 (10.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethiopia: 2 (6.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sierra Leone: 2 (6.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Somalia: 2 (6.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>East Africa: 1 (3.4)</td>
</tr>
<tr>
<td>Country of birth of parents (mother or father)</td>
<td>54</td>
<td>Somalia: 24 (44.4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eritrea: 12 (22.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not known: 7 (13.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sierra Leone: 4 (7.4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sudan: 4 (7.4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethiopia: 2 (3.7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesia: 1 (1.9)</td>
</tr>
<tr>
<td>Refugee status</td>
<td>29</td>
<td>Refugee: 26 (89.7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not a refugee: 3 (10.3)</td>
</tr>
</tbody>
</table>

*The number of valid responses.

Table 2 Country of birth and country where the female genital mutilation/cutting (FGM/C) was performed in children where this information was provided

<table>
<thead>
<tr>
<th>Country of birth</th>
<th>n</th>
<th>Country where FGM/C was performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudan</td>
<td>7</td>
<td>Sudan: 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malaysia: 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eritrea: 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not specified: 1</td>
</tr>
<tr>
<td>Kenya</td>
<td>9</td>
<td>Kenya: 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sudan: 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Somalia: 2</td>
</tr>
<tr>
<td>Eritrea</td>
<td>3</td>
<td>Eritrea: 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Somalia: 1</td>
</tr>
<tr>
<td>Australia</td>
<td>3</td>
<td>Australia: 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesia: 1</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>2</td>
<td>Sierra Leone: 2</td>
</tr>
<tr>
<td>Uganda</td>
<td>1</td>
<td>Somalia: 1</td>
</tr>
<tr>
<td>Somalia</td>
<td>1</td>
<td>Somalia: 1</td>
</tr>
<tr>
<td>Egypt</td>
<td>1</td>
<td>Egypt: 1</td>
</tr>
</tbody>
</table>
not all girls in our series had formal gynaecological review.18 In
been performed in the UK, although 10 cases had been reported
in the UK cohort there was no evidence to con
reported to child protection authorities. In contrast, among the
born parents, had FGM/C performed in Australia and were
refugee travel routes before reaching Australia and/or access to
different FGM/C types, or it may re
impact of cultural groups currently living in Australia, which favour dif-
high frequency of type IV in the UK series may represent an
intermediate trend to less severe forms of FGM/C. Hodes
also noted that type IV FGM/C, particularly when per-
formed in infancy, may heal without scarring and may go
undetected. Furthermore, Australian paediatricians rarely enquire about FGM/C and rarely refer to gynaecological ser-
services for examination.26 In our survey, we did not ask who per-
formed the FGM/C, limiting comparisons with the UK data, where significant numbers had FGM/C performed in a medical setting.18
Consistent with the UK study, the majority of children with
FGM/C in our series were born in Africa, but many did not
undergo FGM/C in their country of birth. This might reflect
refugee travel routes before reaching Australia and/or access to
providers overseas. Two children born in Australia to overseas-
born parents, had FGM/C performed in Australia and were
reported to child protection authorities. In contrast, among the
UK cohort there was no evidence to confirm that FGM/C had
been performed in the UK, although 10 cases had been reported
to UK police because of suspected illegal circumstances.18 In
Australia, there was a recent prosecution in Sydney of a mother,
a cleric and a ‘midwife’ for FGM/C in two children from one
family, and one failed case in Perth.19–23
One child in our study who had FGM/C in Indonesia was
born in Australia, suggesting that she was taken to Indonesia for
FGM/C. This is consistent with the UK study, which reported
three children who had been taken overseas for FGM/C,18 which is illegal in many countries including Australia.32 A
report by UNICEF in 2016 identified for the first time that
Indonesia has a high prevalence (≈50%) of FGM/C in girls aged
<14 years.12 Despite Australia’s proximity to Indonesia and
immigration from Indonesia, only one child who had FGM/C in
Indonesia was reported in our study. This might reflect lack of
recognition by paediatricians of Indonesia as a country where
FGM/C is prevalent, and that types I and IV which are difficult
to detect are common in Indonesia.18 Families from Indonesia are
typically not refugees and do not access refugee health clinics where girls might be screened.

The majority of children with FGM/C in the UK study were
<10 years old when they underwent FGM/C.18 Most of the
children in our study were aged over 10 years when FGM/C
was detected by paediatricians, but we did not ask at what age
FGM/C was performed. A report from one refugee health
service demonstrates that FGM/C in Australian children was
performed from infancy to mid-childhood.18

Complications of FGM/C were reported in eight children; one of whom was referred for psychological counselling. This is
consistent with the UK study in which three children had post-
traumatic stress symptoms.18 Despite psychological distress
being recognised by the WHO and UNICEF as an important
complication of FGM/C, few studies report this outcome.26
Complications reported in our study are consistent with the lit-
erate.11–13 18 but the number of complications is higher com-
pared with the UK study, possibly because there was a higher proportion of children with types II and III, and we reported
only children presenting to specialist paediatric services who are
likely to have more severe problems.

FGM/C is recognised as physical abuse under Australian child
protection laws and children with FGM/C, or at risk of FGM/C,
must be reported to child protection authorities.32 In our study,
only 13 children were referred to, or were already managed by,
child protection services. It is possible that health professionals
might have been unaware of their mandatory obligations to
report, or the laws mandating reporting were not yet enacted in
some Australian jurisdictions before 2013. The Royal Australian
and New Zealand College Of Obstetricians and Gynaecologists
national practice guidelines state: ‘Health care workers who are
concerned that a child may be at risk of, or has undergone,
FGM have legal obligations to report this’.34 The 2012 RACP
policy on FGM/C in children is less specific,25 and requires
revision to provide paediatricians with unambiguous guidance.
Guidelines about mandatory reporting of FGM/C can be found
on Department of Health websites in several Australian
jurisdictions.35–38

It is likely that our study underestimates the number of FGM/
C cases among Australian children. The retrospective design
may have limited the number of cases reported due to recall
bias. Although 20 cases were reported by a refugee clinic in
Melbourne, no details for these cases were provided. Furthermore, we received no case reports from the paediatric
refugee services at the Sydney Children’s Hospitals Network.
This probably reflects lack of screening for FGM/C, rather than
a lack of cases. It is likely that only a small proportion of chil-
dren with FGM/C present to paediatricians, and some FGM/C
types may be difficult to detect. Furthermore, paediatricians
rarely ask about or examine for FGM/C.27

A systematic approach to screening and collaborative, inter-
sectoral data collection is required in Australia to describe the
scope of FGM/C. Because a mother’s FGM/C is the strongest
risk factor for her daughters having FGM/C, collection and
sharing of data between O&G and paediatric services is import-
ant to prevent FGM/C in girls.12 A prospective national

| Table 3  Female genital mutilation/cutting (FGM/C) type, complications and referral among the 31 cases of FGM/C in girls |
| FGM/C type according to WHO classification | No* | No (%) |
| Type I | 10 (38.5) | |
| Type II | 5 (19.2) | |
| Type III | 5 (19.2) | |
| Type IV | 6 (23.1) | |
| Complications reported† | 8 |
| Urinary dysfunction (dysuria, UTI, enuresis and periurethral bleeding) | 6 (75.0) |
| Gynaecological and obstetric complications (dysmenorrhoea, vulvar vaginitis and erythema, sexual problems, fertility problems) | 2 (25.0) |
| Chronic pain | 2 (25.0) |
| Psychological problems | 1 (12.5) |
| Referral | 25 |
| Obstetrics and gynaecology | 19 (76.0) |
| Social work | 16 (64.0) |
| Child protection | 13 (52.0) |
| Psychological counselling | 1 (4.0) |
| Surgery | 1 (4.0) |
| Enuresis service | 1 (4.0) |

*The number of valid responses.†Some children had more than one complication.UTI, urinary tract infection.
surveillance study using the APSU, as has already commenced through the British Paediatric Surveillance Unit in 2015, is proposed.

To prevent FGM/C and its complications, child health clinicians must be appropriately educated and resourced to recognise children with FGM/C or at risk of FGM/C. Although some educational resources, policies and practice guidelines are accessible to Australian paediatricians (table 4), most are presented from an adult O&G viewpoint. There are few educational resources developed specifically for paediatricians, providing guidance on how to engage with families in a culturally sensitive way. Australia needs to strengthen local FGM/C prevention initiatives through an integrated national approach with linkages between paediatric and adult health services, child protection, schools and justice services, while working with the community. Such an approach is embedded in the UK’s Multi-Agency Practice Guidelines. Australian paediatricians and other health professionals who work with children need better awareness of FGM/C through education, and clear, practical guidelines.

Acknowledgements The authors thank all paediatricians who participated in the survey and reported cases and the Royal Australasian College of Physicians for supporting the project. The authors also thank Ms Juliana Nkrumah, the Founder of African Women Australia, for her advice and suggestions in the conduct of this study. Thanks also go to the Study Steering Committee: Dr Shanti Raman, Dr Karen Zwi, Dr Jacqueline Small, Assistant Professor Susan Moloney, Dr Nesrin Varol and Dr Ajay Rane, all of whom provided advice during the development of the paediatricians’ survey.

Contributors EJE and YZ conceived and designed the study, wrote the grant application, contributed to survey design and data interpretation. PS designed the survey instrument, collected and cleaned the data. AP and MD performed statistical data analysis and drafted the results section. SC contributed case data and assisted with data interpretation. All authors revised the manuscript, provided comments and agreed with the final submitted version.

Funding This study was funded by the Department of Health and Ageing (grant ID: DoHa/285/1213). EJE is supported by the National Health and Medical Research Council of Australia (Practitioner Fellowship No. 1021480) and the APSU is funded by the Commonwealth Department of Health and the Australian Research Council.

Table 4 Useful educational resources about FGM/C for health professionals

<table>
<thead>
<tr>
<th>Resource</th>
<th>Available from</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)—FGM e learning training package</td>
<td><a href="http://www.ranzcog.edu.au">http://www.ranzcog.edu.au</a></td>
</tr>
<tr>
<td>New Zealand FGM/C Education Programme</td>
<td><a href="http://fsgm.co.nz/resources/">http://fsgm.co.nz/resources/</a></td>
</tr>
<tr>
<td>Government of Western Australia Department of Health. Female genital mutilation (FGM)—a harmful practice. E-learning package for health professionals</td>
<td><a href="http://www.fgm.co.nz/resources/">http://www.fgm.co.nz/resources/</a></td>
</tr>
<tr>
<td>No FGM Australia</td>
<td><a href="http://www.nofgmoz.com/for-professionals/">http://www.nofgmoz.com/for-professionals/</a></td>
</tr>
</tbody>
</table>

FGM/C, female genital mutilation/cutting.

Competing interests None.

Ethics approval The study was approved by the Human Research Ethics Committee of the Sydney Children’s Hospitals Network (Westmead), approval number LNR/13/2CHN/430.

Provenance and peer review Not commissioned; externally peer reviewed.

Open Access This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

REFERENCES
