Multi-sectoral response to child maltreatment in Switzerland for different age groups: Varying rates of reported incidents and gaps in identification

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Abstract

Background. As many countries lack (multi-sectoral) data on the epidemiology of agency responses to child maltreatment, they do not know if children in different regions of the country have equal chances to receive help and protection. The Optimus Study, the first nationally representative Swiss study on multi-sectoral responses to child maltreatment, examines gaps in identifying children in need and reveals opportunities for improved support and protection.

Methods. A stratified sample of 351 agencies (participation rate 81%) in the social and health sector, public child protection, and the penal sector provided data on new cases between September 1 and November 30, 2016. The resulting study data on 7,651 cases included information on the maltreatment incident, specifics of the report/referral, and child characteristics. The weighting procedure to produce national estimates was based on inverse sampling probabilities and inverse response rates.

Results. In the 3-month period, an estimated 10,335 cases were referred/reported to agencies in multiple sectors of the child protection system in Switzerland. This corresponded to 66 cases per 10,000 children. Rates were highest for adolescents (aged 13+), with 69 cases per 10,000 children. Lower rates for school-aged children coincided with a relatively low percentage of reports/referrals from the schools (8%). Regional variance was extensive, with rates more than quadrupling from a low of 26 cases to a high of 107 cases per 10,000 children. Types of child maltreatment handled by agencies in the different sectors varied. Gender distribution was lopsided for sexual abuse, with many more girls experiencing incidents of sexual abuse, and unequal for incidents of neglect and psychological maltreatment.

Conclusions. There are gaps in the identification of maltreated preschoolers. Promoting health checkups for this age group is a potential solution. However, school-aged children up to age 11 are underreported as well, as the schools contribute only marginally to child

maltreatment reporting. The findings of the study are being used to initiate the implementation of continuous and multi-sectoral child maltreatment surveillance in Switzerland.

1. Introduction

Surveys on the prevalence of child maltreatment – acts of commission and omission (see Leeb, Paulozzi, Melanson, Simon, & Arias, 2008) – in the general population are needed to inform policy makers and administrators on the size of the problem. The enormity of sexual violence against children is reasonably well documented (e.g., Barth, Bermetz, Heim, Trelle, & Tonia, 2013; Sethi et al., 2013; Stoltenborgh, van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011), but the frequency of other forms of violence against children has been studied far less (e.g., Stoltenborgh, Bakermans-Kranenburg, Alink, & van IJzendoorn, 2015; Stoltenborgh, Bakermans-Kranenburg, & van IJzendoorn, 2013).

Moreover, to identify gaps in responses to maltreatment (e.g., underserved populations) as well as biased decision-making, data is required on reported incidents of child maltreatment (Jud, Fegert, & Finkelhor, 2016). However, worldwide, efforts to collect national administrative data on agencies' knowledge of child maltreatment are rare (Jud et al., 2016; Jud et al., 2013; Krüger & Jud, 2015). Not only countries with a low gross domestic product (GDP) but also many high-income countries lack systems for child maltreatment surveillance. Complex, federally organized child protection systems have been identified as one of several barriers to administrative data collection in child protection (Jud et al., 2013). Another problem is that existing data collections are limited, in that they, for example, focus on documenting the services provided without linking these services to specific problems or types of child maltreatment. However, complexity in child protection systems is generally high: Multiple sectors and disciplines contribute everywhere to the safety and support of victimized children, not just in federally organized countries. Differing discourses, terms, and definitions decrease comparability across disciplines and associated organizations (see Jud & Voll, 2019). Under these circumstances, efforts to collect reported incidents of child maltreatment across multiple sectors are even rarer.

1.1 International efforts to collect multi-sectoral data in child protection

For four decades, the United States' National Incidence Study (NIS) has gathered incidents reported to child protective services (CPS) and cases documented by "sentinels" such as staff at day care and residential care facilities, shelters, law enforcement departments, schools, social services, medical and mental health agencies (e.g., Sedlak et al., 2010, p. 2). In the fourth study

(NIS-4), the 1220 participating agencies were spread across a nationally representative sample of 122 counties selected with probability proportional to size to ensure a representative mix of different geographic regions by degrees of urbanization, crime rates, percentage of households headed by single women, and CPS substantiation rates (Sedlak et al., 2010). Two 3-month reference periods (September 4 through December 3, 2005 and February 4 through May 3, 2006) for data collection were chosen. Applying the more inclusive "Endangerment Standard" (also covering children not yet harmed by maltreatment), an estimated 2,905,800 children in the United States – or one in every 25 – came to the attention of professionals working in child maltreatment (Sedlak et al., 2010). Of these, 29% experienced acts of commission and 77% neglect: The overlap reflects multiple incidents of victimization; many children also experienced multiple physical, emotional, and sexual victimizations (Sedlak et al., 2010). Rates varied not only by child characteristics such as gender, age, or ethnicity but also by family characteristics such as parents' unemployment or contextual variables such as degree of urbanization of a country. Two to three times higher rates of neglect for children with unemployed parents than for children with employed parents might be associated with unemployed parents' decreased parenting capacities or a lack of financial means to adequately support children's development. Other variances in rates may reflect biased under- or overrepresentation: The significantly lower maltreatment rates for 0- to 2-year-olds than for older children possibly reflect under-coverage of this preschool age group, which is less visible to community professionals.

The Netherlands Prevalence Study on Maltreatment of Children and Youths (NPM) adapted the NIS-methodology to the Dutch context in three completed cycles, one just recently. For the second cycle in 2010, data were collected from all 15 CPS and from professionals at 449 day and residential care facilities, shelters, agencies in law enforcement, medical agencies, schools, and school services (Euser et al., 2013). The NPM collected sentinel data over a 3-month period and extrapolated to annual numbers; seasonal variation was controlled for by assuming the same percentage of caseload for sentinel data as for (annually available) CPS data in the same period. In 2010, an estimated 96,175 children, or 2.7% of all Dutch children, were victims of child maltreatment according to sentinel data. The 22,661 substantiated cases of maltreatment reported to the CPS agencies made up 0.6% of all Dutch children. Comparable to NIS-4, the Dutch NPM-2010 revealed a significantly higher rate of sexually abused girls than boys and an increased relative risk for children with unemployed parents and for minorities (Euser et al., 2013).

In Switzerland, a first nationwide agency survey on child sexual victimization in the framework of the Optimus Study (2009-2011) collected data from professionals at 350 agencies across different sectors over a 3-month-period from March 1, 2010 to August 31, 2010 (Maier, Mohler-Kuo, Landolt, Schnyder, & Jud, 2013). An estimated 2.68 out of 1,000 children in 2010 came to the attention of professionals for child sexual victimization, with girls significantly more affected than boys. Findings on sexual victimization documented by the Optimus Study South Africa were reported by Ward et al. (Ward, Artz, Leoschut, Kassanjee, & Burton, 2018).

A secondary analysis of the Swiss Optimus Study (Weber et al., 2017) revealed that the decision to provide psychotherapy to the sexually abused children was at first sight needs-driven (severity of harm) but also heavily biased, as immigrants and recurrently reported children were less likely to be referred to psychotherapy. Additionally, variation at the regional level was large (Maier et al., 2013). Unfortunately, this first multi-sectoral agency survey on incidents reported to the child protection system was restricted to child sexual victimization. However, evidence highlights that many children are impaired by multiple victimizations (e.g., Dong et al., 2004; Romano, Bell, & Billette, 2011), and child sexual victimization is responsible for the smallest contribution to agencies' caseloads compared to other types of child maltreatment (e.g., Sedlak et al., 2010; Euser et al., 2013).

Another limitation of the first nationally representative study on agency responses to child sexual victimization in Switzerland was the relatively low participation rate of agencies, particularly in the French- and Italian-speaking parts of the country (Maier et al., 2013). To boost agency participation, an intermediary cycle 2 of knowledge mobilization reached out to administrators and policy makers at the national, regional, and municipal level as well as to frontline workers and created a practice-validated and therefore relevant and credible questionnaire (Jud, Koehler, et al., 2018). It resulted in Optimus Study Cycle 3, the first Swiss study on agency response to all forms of child maltreatment. In this paper, we present findings on case-level and regional variation in reported incidents in Switzerland. A brief overview of the different sectors of the Swiss child protection system and their data collection efforts is provided first.

1.2 Child protection in Switzerland

This section is abbreviated from more detailed overviews by Jud and colleagues (Jud & Knüsel, 2019; Jud, Koehler, et al., 2018). Reporting laws for professionals have gradually

moved towards more "mandatoriness." The new Child and Adult Protection Law, implemented in 2013, mandates professionals "acting in an official capacity" to report to child protection authorities when a "person needs assistance" (Art. 443 Swiss Civil Code). Per January 1, 2019, this mandate was expanded to include any professional working with children (Art. 314d.1 Swiss Civil Code). Notwithstanding this requirement, the decision to report still depends on professionals' discretion: They must decide whether the situation is sufficiently serious to be reported and whether it can be adequately addressed by subsidiary services within a reasonable time frame (Rosch, 2012). Professionals bound by professional confidentiality according to the Swiss Criminal Code (e.g., physicians) are exempt from this mandate.

Although Switzerland's national population of around 8.5 million is relatively small-scale, a major structural feature of the Swiss child protection and child welfare system is its complexity. The 26 cantons (states) of Switzerland differ in their organizing of protection and support for children in need along different disciplines and sectors. There is also cultural and linguistic variety with three major languages spoken, German, French, and Italian. Government-run services, legally mandated non-governmental agencies, and professionally mandated services with a focus on child protection in Switzerland (cf. Trocmé, Akesson, & Jud, 2016) may be categorized in three sectors:

- **Public child protection:** Based on the Swiss Civil Code (SCivC), child protection authorities (courts or administrative authorities) may issue a general and unspecified mandate to social workers in a specialized or general social service agency, appointing them as a deputy to the child. In more severe cases, the authorities can place the child in out-of-home care or ultimately withdraw parental custody. At a subsidiary level, child welfare services have to offer help and counseling to children and families free of charge.

  To justify a child protection order, the SCivC refers to the term "child's well-being and its endangerment" (e.g., Art. 307 SCivC). Endangerment obviously includes parental acts of commission – sexual abuse and psychological and physical maltreatment. In the same article, the SCivC further restricts its responsibility to situations where "[…] the parents are unwilling or unable to remedy the situation […]" (Art. 307 No 1 SCivC). Child protection authorities are therefore not mandated to intervene in problematic situations where parents support their children and/or voluntarily seek professional support (e.g., on mental health issues, bullying by peers). However, they are to respond to acts of omission, whether deliberate ("unwilling") or arising out of a lack of capacity or resources ("unable"). Overall, the cases seen by the child protection authorities

largely coincide with international definitions of child maltreatment (e.g., Leeb et al., 2008).

- **Penal sector:** By prosecuting offenders, the police departments, (juvenile) prosecution agencies, and criminal courts can be a part of protecting the child from further harm.
- In the **social and health sector**, there are both public and private specialized agencies supporting children affected by child maltreatment. They include interdisciplinary child protection teams (in hospitals or regionally administered), private counseling centers focused on support for victims of child sexual victimization, and publicly funded victim aid agencies.

These three broader categories cover agencies specializing in protecting and supporting victimized children; many more offer help and support to children and families with difficulties, social problems, mental health issues, etc. Everywhere, data collection is fragmented and far from uniform or harmonized. Although most agencies still gather standardized information using their agency's own idiosyncratic approach, there are some national efforts to collect child protection-relevant data at a national level. These efforts include federal annual reports on Police Criminal Statistics (e.g., Federal Statistical Office, 2019) and on services by victim aid agencies (e.g., Federal Statistical Office, 2017a, 2017b), an annual report on newly enacted and ongoing child protection orders (e.g., Konferenz für Kindes- und Erwachsenenschutz (KOKES), 2018), and a national data set for cases of hospital child protection teams (e.g., Wopmann, 2019). Only recently, data collection for the annual report on newly enacted and ongoing child protection orders (KOKES, 2018) has started to include types of child endangerment on an optional basis. Moreover, agencies' participation in the latter two data collection efforts is not mandatory; incomplete or missing data regularly occur. An initiative aiming at sharing uniform data across sectors has been lacking so far.

2. Methods

Optimus Study Cycle 3 invested in an innovative approach of utilizing individual agencies' standardized data to reduce the work burden for participation and consequently boost participation. Agencies exported cases from their own data management software and uploaded an anonymized version on a secured web-based data integration platform. The data from the individual files were then mapped into a standardized format.

2.1 Sample

The sampling strategy covered two units of analyses: agencies and cases. The agency-level sample was drawn from government-run services, legally mandated non-governmental agencies, or professionally mandated services with a focus on child protection described in section 1.1. All police forces (125 units) and all agencies with a focus on child protection in the social and health sector (101 specialized agencies) were included. The universe sampling strategy for these sectors was complemented by a stratified random sample of the more frequent agencies in public child protection. The sampling procedure was as follows:

1) Agencies in public child protection were subdivided into child protection authorities responsible for enacting child protection orders and child welfare services responsible for providing mandated and non-mandated services.
2) Organizing child protection is the responsibility of the 26 states (cantons) of Switzerland. They were therefore chosen as strata, with separate substrata for language regions in the four bilingual cantons.
3) In all cantons with a total $N \leq 5$ child protection authorities, these agencies were sampled with certainty. For cantons with a total $N > 5$ child protection authorities, a weighted sample of 50% per stratum was drawn.
4) Accordingly, in cantons with a total $N \leq 5$ child welfare services, these agencies were sampled with certainty. A weighted sample of 25% per stratum was drawn in cantons with a total $N > 5$ child welfare services.
5) To cover a major part of the Swiss population, the 10 largest cities with more than 50,000 inhabitants were treated as a separate stratum with a complete inclusion strategy.

The described sampling strategy in the public child protection sector led to the inclusion of 95 child protection authorities and 111 child welfare services. For all three sectors, a total sample of 432 agencies out of 643 agencies were selected; 351 agencies (81%) participated (Jud, Koehler, et al., 2018). The reason for non-participation was mainly lack of reliably standardized administrative data.

For the participating agencies, all newly reported cases in the 3-month period from September 1 to November 30, 2016 were selected. Newly issued mandated services transferred to child welfare services were not considered, as they corresponded to the child protection

orders that were collected from child protection authorities. New cases were operationalized as either first time referral/report of the index child or recurrent referral/report after a previous case for the index child was closed. For the 351 participating agencies, a total of n = 7,651 cases were included. 32 participating agencies had no new cases in the 3-month period. They were still included in the weighting procedure (see section 2.4).

2.2 Variables

Two principles guided the process of developing a set of variables: First, we wanted the set of variables to be in line with state of art in research on agency responses to child maltreatment. Second, the selected variables had to be largely available in the administrative data sets of agencies in the Swiss child protection system. The cooperative exchange between research and practice (see Jud, AlBuhairan, Ntinapogias, & Nikolaidis, 2015) in development of the data collection tool is described elsewhere (Jud, Koehler, et al., 2018). The result was a minimum data set of 25 case variables that included report specifications (date, source, prior report) and data on the incident (type, start and frequency of primary maltreatment, type of further maltreatment(s)), the child (gender, age, canton of residence, disability, living situation, siblings, social aid), the perpetrator (number of perpetrators, relation to the child, age, gender), and the services (services initiated by the organization itself, referrals to other organizations). Operationalization of variables included in the analyses for this paper is described in the following:

Child gender and age. Child gender was binary coded as girls and boys (2% missing). The five age categories – 0-2 years, 3-6 years, 7-12 years, 13+ years – were chosen based on child development and the Swiss school system. The study covers data up to the age of 17, as the legal age of majority in Switzerland is 18 in accordance with UN definitions of childhood. For 8% of cases, information on age was (partly) missing. For many victim aid agencies, only a crude distinction between 0-10 years and 11-17 years was available; these cases were therefore not included in the detailed analyses.

Primary type of child maltreatment. The types of maltreatment consisted of the ‘classical’ types of neglect – sexual abuse, physical maltreatment, and psychological maltreatment. We based the definitions on the multi-disciplinary definitions by Leeb et al. (2008), but they were not restricted to violence by caregivers and included also violence by acquaintances and strangers. Further, due to its prevalence in the caseloads of child protection services (e.g.,

Trocmé, 2008), children's witnessing of intimate partners' violence was included as a further category of victimization. To acknowledge other sources of adverse childhood experiences and household dysfunctions (see Felitti et al., 1998), we added an option for "other child endangerment." This primarily covered situations of self-inflicted violence and deaths of loved ones. Based on the common data collection procedure of many agencies, we chose to determine a primary type of maltreatment. If the agency had prioritized this information itself or if only one type of child endangerment was documented, we directly transferred this information. In the case of several, non-prioritized situations of child endangerment, the primary type of maltreatment was chosen at random.

Source of report/referral. The source of report/referral was divided into 7 categories (34% missing). Three categories were private sources: the child, a parent, or any other relative. The other four categories were professionals: in the social sector, health sector, schools, and penal agencies. The social sector comprised agencies such as (child) welfare services, community services, child protection authorities, out-of-home care, etc. Hospitals, child and adolescent psychiatry, private pediatricians, and the like were categorized as the health sector. The category schools contained teachers and principals as well as professionals in school services such as school social workers. The term penal agency referred to any entity in the penal system including police forces, (juvenile) prosecution, and courts.

Type of agency. The sectors of the Swiss child protection system were described above in section 1.1. The number of agencies participating in the study for each type of agency are shown in parentheses as follows: clinical child protection teams (23), regional child protection teams (23), child protection authorities (77), child welfare services (74), police forces (125), and victim aid agencies (29).

Regions and languages. The seven regions displayed correspond to the NUTS-2 level of geographical coding in the European Union (Regulation (EC) No 1059/2003) and the TL-2 level of geographical coding by the OECD (2018). Whereas most entities include more than one canton, Zurich refers to the Canton of Zurich and Ticino to the Canton of Ticino. The Canton of Ticino corresponds roughly to the Italian-speaking part of Switzerland. *Region lémanique* (Lake Geneva region) is predominantly French-speaking; in *Espace Mittelland* the majority is German-speaking. All other regional entities – Central Switzerland, Eastern Switzerland, Northwestern Switzerland, and Zurich – are German-speaking only.

Child residents. On December 31, 2016, a total of 1,509,886 children were living in Switzerland (Federal Statistical Office, 2018). Further numbers on child residents per age group

and/or geographic region for rates were drawn from data from the Swiss Federal Statistical Office.

2.3 Procedure

As mentioned above, the data collection approach aimed at reducing the work burden of the participating agencies, as it is the most important barrier to data collection in agency surveys. We therefore used the administrative data of the different agencies. The standard procedure had five steps (for a more detailed description, see Jud, Kosirnik, et al., 2018):

1) One person at each agency exported the cases within the data collection period from the agency's respective software.
2) They anonymized the exported cases by deleting names and addresses.
3) The export was then uploaded via a secured web-based graphical user interface to the server infrastructure; any software format was possible.
4) Algorithms immediately mapped the agencies' own data onto the uniform and standardized study format; any personal identifiers that had been unintentionally left in the uploaded export was sorted out and immediately deleted.
5) As a final optional step, agencies were able to complete missing information via the same interface.

To further ease participation, variations of this standard procedure were offered:

- As mentioned above, some agencies provide their data to multi-agency data sets, namely, data on victim aid and criminal offenses to the Federal Statistical Office (FSO) (2017a, 2017b, 2019), data on child protection orders to the umbrella organization KOKES (2018), and data on child maltreatment cases seen at hospitals to the Swiss Society of Paediatrics (SSP) (e.g., Wopmann, 2019). All these agencies had to do was to allow us to use their data in these data pools.
- Agencies using software and servers of the Diartis software company in Lenzburg, Switzerland, were able to commission the company to extract their data.
- Manual entry of data using an Excel file was developed for agencies that were: (a) not equipped with data collection software, (b) had no export function in their software, or (c) preferred not to export data from their software for various reasons.

Upstream of data collection, the research team was working on clarifying the semantics of variables and their values to ease data acquisition and ensure semantic integrity of the data. To

this end, we had previously collected agencies' graphical user interfaces and variable definitions to predefine algorithms for the mapping of agency data onto the standardized format. Sometimes, the operationalization of certain response categories had to be clarified extensively with the agencies, as written operationalizations were lacking. The mapping process was tested for around a dozen agencies prior to data collection, based on the agencies' data sets from previous years.

The security concept for the web-based infrastructure included access limited to a clearly defined set of preregistered users that had signed a disclaimer of confidentiality and 2-factor authorization of preregistered users to achieve e-banking level security. Ethical procedures included both a declaration of no objection from the Ethics Committee of Northwest and Central Switzerland and thorough discussion with all 26 cantonal and several municipal data protection officers. As the data were highly sensitive and deduplicating cases across agencies would have included (proxies of) personal identifiers, procedures of deduplicating cases were prohibited.

2.4 Statistical analyses

To produce national estimates, a combination of weights was applied. Design weights were calculated as the inverse of the sampling probability within each stratum. They were then multiplied with the inverse response rate for each stratum. Strata with single sampling units were treated as certainty units; variance estimation was based on the jackknife resampling technique. A finite population correction (FPC) was applied to avoid inflated standard errors of the estimate, as the sample was close to the population of agencies. All analyses were generated using Stata/SE 16.0 (StataCorp, 2019).

3. Results

Between September 1 and November 30, 2016, an estimated 10,335 cases were referred/reported to agencies focusing on child protection in Switzerland. This corresponds to 66 cases per 10,000 child residents. The rate for different age groups ranged from 57 cases per 10,000 child residents for 0-2 years of age to 69 cases per 10,000 child residents for adolescents (13+ years) (Table 1).

Around two thirds of all 10,035 cases were handled by the child protection authorities on a mandated basis and by the child welfare services on a voluntary basis (Table 1). At the other end of the spectrum, interdisciplinary regional child protection teams handled an estimated 159 cases in the same 3-month period. The age distribution differed for the analyzed sectors: Investigations of criminally liable violence against children peaked for adolescents (13+ years); child protection authorities and clinical child protection teams peaked at services for the 0- to 2-year-olds relative to the general population (Table 1). Child welfare services were the only sector that peaked at services for 3- to 6-year-olds relative to the general population. Gender distribution across the different sectors was similarly skewed for different types of victimization (table available as supplementary material).

The number of children known to agencies differs not only for different sectors of the child protection system but also for geographical and jurisdictional areas. In the highly urbanized Canton of Zurich, a total of 107 cases per 10,000 children were known to agencies in the different sectors of the child protection system. The rate in the Italian-speaking Canton of Ticino was considerably lower, at a total of 26 cases per 10,000 children (Fig. 2). Some regions displayed a pattern similar to that for Switzerland as a whole, but other regional age distributions described a curve that was U- or J-shaped, as the youngest and oldest children received relatively more attention. This pattern was the most pronounced for the Canton of Zurich, where children aged 7-12 were known to agencies at a rate of 85 cases per 10,000 children, compared to rates of 104 cases per 10,000 children for 3- to 6-year-olds and 116 cases per 10,000 children for adolescents (Fig. 2).

Agencies in the different sectors of the child protection system coded situations of endangerment quite differently (see section 2.2 above) and sometimes lacked operationalized data on the type of violence responsible for their intervention. Unfortunately, in a majority of cases (68%) handled at the child protection authorities, the type of maltreatment was not documented or categorized; the same was true for 38% of cases at child welfare services (Fig. 3). Among those cases with a documented type of child endangerment, neglect was most prevalent. The types of situations handled by the other sectors differed (Fig. 3). Police forces handled cases of alleged physical maltreatment (30%), followed by cases of witnessing intimate partners' violence (24%). Victim aid agencies predominantly handled cases of child sexual abuse (38%). A more even distribution was found for clinical child protection teams, with cases of psychological maltreatment (27%) followed by cases of physical maltreatment (23%) and sexual abuse (23%).

A quarter of documented sources of reports/referrals originated from the (larger) family system, mainly by parents (17%; Fig. 4). The three quarter of reports/referrals by professional were divided into the health sector (27%), penal agencies (22%), the social sector (18%), and schools (8%) (Fig. 4). Criminal prosecution was primarily initiated by parents (45%) or (older) children themselves (16%). Cases reported to clinical child protection teams were predominantly referred from within the health system (74%), mostly from a hospital.

4. Discussion

The Optimus Study Switzerland Cycle 3 is one of the few international surveys to collect data on reported incidents of child maltreatment across multiple sectors of a child protection system. An estimated 10,035 cases, or 66 cases per 10,000 children, came to the attention of agencies in Switzerland's child protection system within a period of 3 months. Relative to the general population, adolescents (13+ years) have higher estimates or a higher possibility of entering the system than younger age groups. The sectors of the child protection system differ in many ways – in number of cases, age group focus, types of situation, and gender distribution. Regional variance is extensive, too: Cases more than quadrupled between the region handling the lowest number (26) of cases per 10,000 children and the region handling the highest number (107) of cases per 10,000 children.

For the total of 1,509,886 children residing in Switzerland in 2016 (Federal Statistical Office, 2018), the estimated 10,035 reports/referrals to agencies in the child protection system from September 1 to November 30, 2016 make up 0.66% of children. If no seasonal variation in reports/referrals existed, the annual number would almost match the 2.7% annual rate of the multi-sectoral data collection by the NPM in The Netherlands (Euser et al., 2013). However, available annual data from some of the Swiss agencies speak of considerable seasonable variation from 20% to 33% of the annual caseload in the 3-month period. Annual rates therefore likely range from 2.01% to 3.32% of all child residents, which is still in a range comparable to the Dutch data. The higher rate of 4% of all children who are known to agencies in the United States according to NIS-4 (Sedlak et al., 2010) might partly be attributable to the U.S. system's focus on "harmful behavior of malevolent parents, which called for legal investigation and public measures to control deviant, if not outright criminal, behavior" (Gilbert, 2012), which is associated with a decades-old mandated reporting legislation for professionals. It likely lowers the threshold for entering the system and increases the likelihood of false negatives. Challenges in health care (lack of health insurance) and a less generous welfare state compared to European

countries might be further reasons for elevated rates in the United States (see the OECD Social Expenditure Database (SOCX) at www.oecd.org/social/expenditure.html). Both the NIS-4 (Sedlak et al., 2010) and the NPM (Euser et al., 2013) included an even wider range of agencies than the Optimus Study Switzerland. A similar range of agencies in the Swiss study would have increased the rate.

Compared to The Netherlands' NPM (Euser et al., 2013) and to the United States' NIS-4, the youngest age group in Switzerland is only slightly underrepresented. Each child born in Switzerland is reported to infant health care services, which contact all parents and offer services free of charge; up to 16 visits by a midwife are covered by health insurance (Art. 29, Federal Health Insurance Act). Pediatric routine checkups (Ambühl et al., 2011) are frequent up to the age of 2 years, and health insurance reimburses eight health and development consultations for the preschool child (Federal Office of Public Health FOPH, 2019, p. 8).

The lowered rate in school-aged children compared to adolescents corresponds with a low percentage of reports/referrals from the schools. Even though teachers see their pupils on an almost daily basis, this important source of detecting and reporting negative developments is clearly underused: In many regions relatively fewer school-aged children are known to agencies in child protection than babies and toddlers. Previous findings revealed that as long as the parents seem cooperative, school professionals are reluctant to report even if the child's situation does not improve (see Jud & Gartenhauser, 2015). Findings also point to procrastination on reporting until it is almost too late (Jud, Stauffer, & Lätsch, 2018): Professionals often assume that their colleagues at the next educational level will address a problematic situation. The elevated rate of reports/referrals for adolescents (aged 13+) may therefore indicate underreporting at earlier stages of children's development. Variances in other sources of reports/referrals are attributable to specific procedures. For clinical child protection teams, the majority of incidents are reported internally within hospitals.

The varying distribution of types of child maltreatment for agencies in the different sectors of the child protection system mainly corresponds with the agencies' different foci. Physical violence is more easily documentable; chances are higher that the courts will convict an offender. Some victim aid agencies focus exclusively on child sexual abuse and have large caseloads (Maier et al., 2013). This likely explains the dominance of child sexual abuse cases in victim aid agencies. Although physical maltreatment and sexual abuse rank second in the caseload of clinical child protection teams, it may come as somewhat of a surprise that incidents of psychological maltreatment rank first for this group of agencies. However, many agencies still lack operationalized data that could be transferred to a uniform set of definitions across

sectors: Child protection authorities still predominantly document the child protection order issued without documenting the basis for this. Law professionals are particularly reluctant to document specific and operationalized incidents (Diana Wider, secretary general of the National Association of Child and Adult Protection Authorities, personal communication, August 16, 2019). Child welfare services sometimes mix together categories of types of child maltreatment with functional categories, such as in-depth assessment. There is also a reluctance for these two types of agencies to use the terms child maltreatment or neglect. They much prefer the term child endangerment and apply child maltreatment only to the most severe forms of child victimization (see Jud & Voll, 2019). Other countries and jurisdictions have used terms such as "risk for future maltreatment" to document incidents below the threshold for child maltreatment. However, on the whole, outcomes do not significantly differ for the groups of substantiated child maltreatment and cases of risk for future maltreatment (Fallon, Trocmé, MacLaurin, Sinha, & Black, 2011).

The regional variance in number of cases handled by the child protection system is large, with rates more than quadrupling between the Italian-speaking Canton of Ticino and the highly urban Canton of Zurich. However, a crude approximation of operationalizing urban/rural differences does not show any differences in analyses. National distributions of wealth and assets also do not point in the direction of vast differences that might be responsible for the extended variance in rates of child maltreatment known to agencies. Not only rates in total but also the distribution of rates per age group varied regionally. There is another likely avenue for interpretation: Although we applied uniform definitions to the data compiled from different agencies, the varying concepts applied by different agencies in different languages and disciplinary contexts might still have contributed to the variations in detection and recognition of maltreatment situations. This avenue also adds to the interpretation of low rates of neglect in the Swiss child protection system in comparison to other countries (see Trocmé, 2008), as generally low poverty and employment rates in Switzerland cannot explain the rather large differences. In the NIS-4 (United States) (Sedlak et al., 2010) and the NPM (The Netherlands) (Euser et al., 2013), professionals applied the studies' categories to cases. In contrast, we compiled the individual agencies' own data and transformed it using uniform definitions. The varying conceptual approaches across sectors is obvious in the distinct lack of identifying situations of endangerment as child maltreatment. It is likely that many of these uncategorized situations of endangerment would qualify as child neglect. Both practitioners and academics have struggled with definitions of neglect (e.g., McSherry, 2007; Taylor, Daniel, & Scott, 2012), as the omission or negation of an act is more difficult to deal with cognitively.

Although the study's major strength is its unprecedented participation of agencies, the innovative approach of collecting data via the agencies individual administrative data and then transforming the data into shared definitions also comes with limitations. First, the most important limitation is missings. Although we had collected information on the availability of variables in a previous phase of knowledge mobilization (Jud, Kosirnik, et al., 2018), there were still many variables that were sometimes completely lacking in the data from some agencies, particularly data on the perpetrator(s). And child and caregiver risk factors are collected quite differently by the various agencies in different sectors of the system, if collected at all. The lacking categorization of situations of child maltreatment has already been discussed. An implicit goal of this study was also to identify shortcomings in agencies' individual data collection in order to define strategies for a more uniform and shared approach to data collection on children and families in need (see Jud, Kosirnik, et al., 2018). Second, different operationalizations of variables by different agencies often led to relatively broad categories. For example, whereas some agencies differentiated between different agencies in the health sector (such as hospitals, child psychiatry, private pediatricians, and so on), others collapsed all the agencies into one category. Third, this study did not cover all agencies that potentially deal in some form with cases of child maltreatment. We focused on agencies that have been appointed by the state for this task or those with a specific focus on child maltreatment and therefore those with the largest caseload. Including agencies with more zero-inflated caseloads would have decreased the excellent participation rate. Fourth, the data may potentially overestimate the incidents of child maltreatment in the Swiss child protection system, as ethical committees did not allow application of techniques for data deduplication. The involvement of professionals from different organizations and sectors is common in child protection cases. However, previous analyses of case flow in the Swiss child protection system (Jud, Perrig-Chiello & Voll, 2011) and the comparable German child protection system (Fegert, Berger, Klopfer, Lehmkuhl & Lehmkuhl, 2001) revealed that the professionals and organizations involved accumulate over a period of multiple months and years. The data collection in this study focused on a relatively short period of 3 months. This should have decreased the likelihood of doubled cases. Further steps to avoid doubled cases are described in the Methods section above (see 2.1). Last, all the data reflect the assessments of professionals in the field and were not separately validated. However, this is in line with the goal of documenting professional decision-making and thereby identifying potential biases.

Despite these limitations, this study constitutes important progress on tackling the lack of multi-sectoral child maltreatment surveillance in Switzerland. For the Optimus Study 3,

financial support by a private foundation was necessary to carry out the project and to point out the need to develop and strengthen child maltreatment research within public sector. Switzerland's complex public sector struggles to recognize the importance of the problem and to provide the financial means for surveillance, despite its international commitments.

5. Conclusion

A multi-sectoral view is the only way to gain a global view of a child protection system and to discover its shortcomings and strengths. The advantage of this global view is highlighted by findings revealing variances across sectors and regions, for example by identifying underserved age groups or lacking referrals/reports from the schools. Consequently, focusing on a single sector in the child protection system for national child maltreatment surveillance may provide highly skewed information to policy makers on how the system succeeds in addressing child maltreatment. The complexity of the Swiss system, which brings together several cultures in a limited territory, made it possible to explore the importance of cultural factors. More multi-sectoral studies worldwide are needed in order to explore whether other systems struggle with similar biases of vast regional and inter-sectoral disparities, so as to find ways to best address them.

As the study data collection, cleaning, and primary analyses have largely been completed, the research team has been touring with the findings and presenting them to policy makers in the cantons, who in Switzerland's federal system are the most important stakeholders for progress in the area of (structural) child protection. Many of them are impressed by the findings and will likely initiate changes in data collection, in particular to address missing information on important indicators and surveillance at the cantonal level. Most importantly, this process will have initiated a move towards uniform data collection of situations of child maltreatment as a basis for continuously improving children's lives (see Sethi, 2013, p. 4). Only trend data will make it possible to identify whether policies that are based on collected data have contributed to decreasing incidents of child maltreatment. For example, the Optimus Study could be a benchmark to show the (potential) effect of a ban on corporal punishment, for which there is now a push for finally legally enforcing it in Switzerland. Continuous cycles of informing policy makers on gaps in reporting/referrals of maltreatment incidents and on opportunities for upscaling successful procedures and interventions are therefore a pillar of improving children's lives everywhere.

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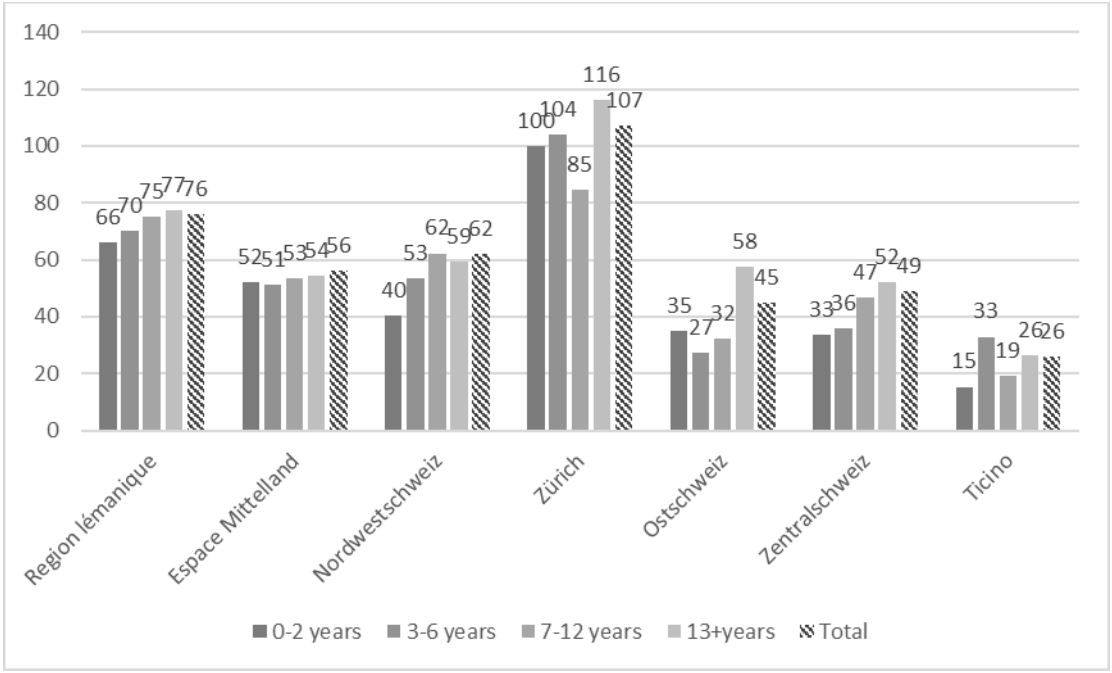
Table 1 Children known to agencies in different sectors of the child protection system, separated for age groups.

Sector	Child protection authorities		Child welfare services		Police forces		Victim aid agencies[1]		Clinical child protection teams		Grand total[2]	
	Est.	per 10K	Est.	per 10K	Est.	per 10K	Est.	per 10K	Est.	per 10K	Est.	per 10K
Age 0-2 yrs.	678	26	456	18	126	5	72	3	149	6	1483	57
Age 3-6 yrs.	697	20	787	23	224	7	137	4	145	4	2024	59
Age 7-12 yrs.	1104	22	994	20	446	9	147	3	175	4	2941	60
Age 13+ yrs.	1026	25	786	19	650	16	187	5	170	4	2860	69
Total[3]	3531	23	3096	21	1487	10	1030	7	731	5	**10035**	**66**

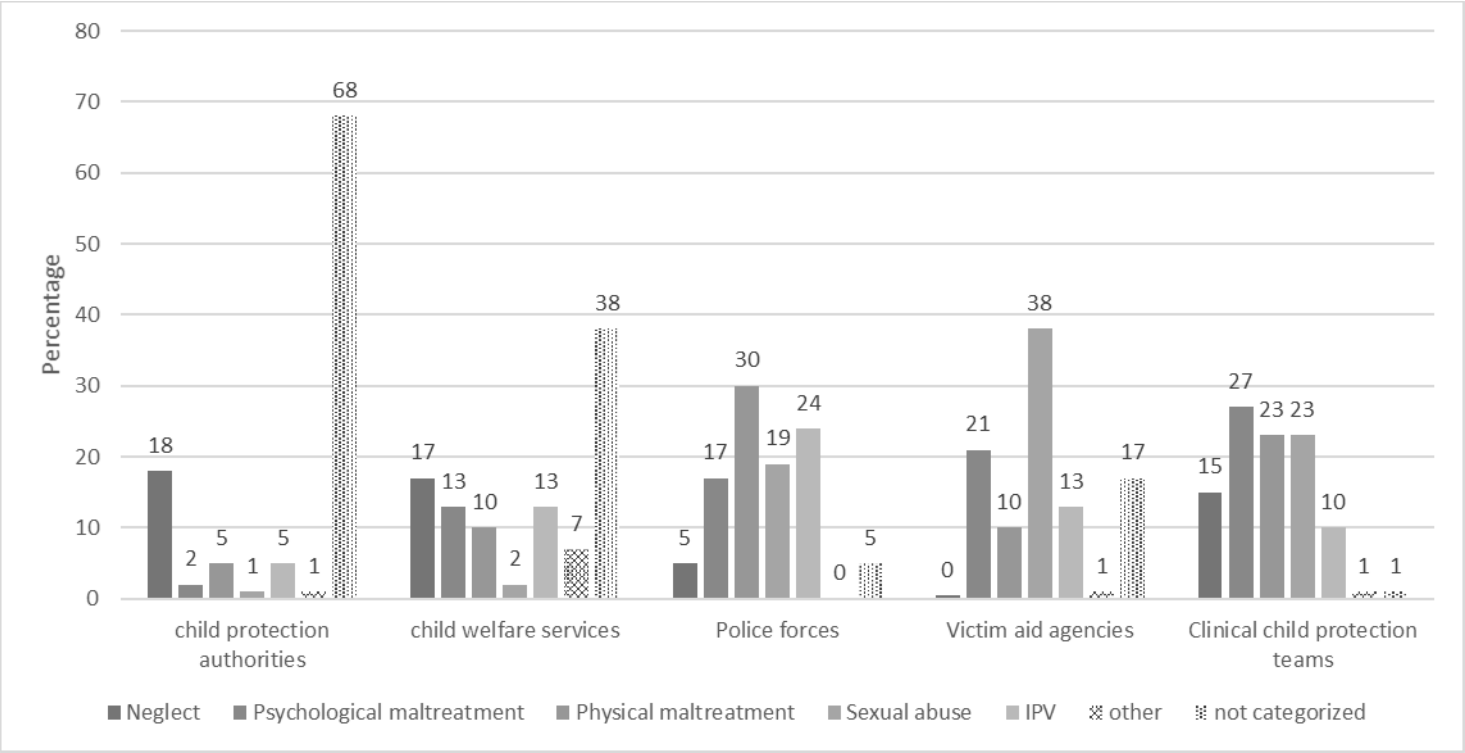
Note. Est. = weighted estimates for 7021 cases referred/reported between Sept 1 and Nov 30, 2016 with non-missing age; per 10K = per 10,000 children in the respective age group for 2016; [1] 345 cases were excluded in the estimates for age groups; [2] the relatively small number of children referred to regional child protection teams is not displayed separately but included in the grand total; [3] estimates are based on the total 7651 cases referred/reported between Sept. 1 and Nov. 30, 2016.

Figure 2 Rate of cases per 10,000 child residents known to agencies in different regions.



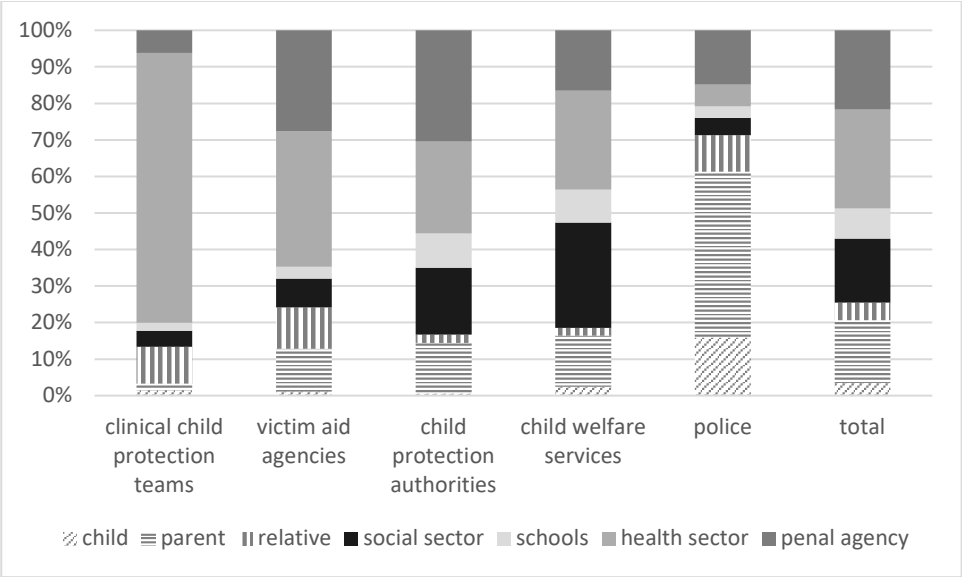
Note. Rates are calculated based on weighted estimates of 7,021 cases referred/reported between Sept. 1 and Nov. 30, 2016 with non-missing age and 7,651 cases referred/reported between Sept. 1 and Nov. 30, 2016 for the total.

Figure 3 Percentage of primary type of child endangerment documented by agencies.



Note. Weighted proportion based on 7,651 cases referred/reported between Sept 1 and Nov 30, 2016; the relatively small number of children referred to regional child protection teams is not displayed separately.

Figure 4 Proportion of source of report/referral for different sectors of the child protection system.



Note. Weighted proportion based on 5,048 cases referred/reported between Sept 1 and Nov 30, 2016; the relatively small number of children referred to regional child protection teams is not displayed separately but included in the grand total.