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Characteristics of child maltreatment investigations referred by healthcare professionals in Ontario: Opportunities for collaboration, prevention, and intervention.

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Complete List of Authors:	Livingston, Eliza; University of Toronto, Factor-Inwentash Faculty of Social Work Joh-Carnella, Nicolette; University of Toronto, Factor-Inwentash Faculty of Social Work Lindberg, Daniel; University of Colorado - Anschutz Medical Campus, Departments of Emergency Medicine & Pediatrics Vandermorris, Ashley; The Hospital for Sick Children, Division of Adolescent Medicine Smith, Jennifer; The Hospital for Sick Children, Department of Paediatrics Kagan-Cassidy, Miya; University of Toronto, Factor-Inwentash Faculty of Social Work Giokas, Danielle; University of Toronto, Factor-Inwentash Faculty of Social Work Fallon, Barbara; University of Toronto, Factor-Inwentash Faculty of Social Work

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Characteristics of child maltreatment investigations referred by healthcare professionals in Ontario: Opportunities for collaboration, prevention, and intervention.

Eliza Livingston, BSc[1], Nicolette Joh-Carnella, BA[1], Daniel M. Lindberg, MD[2], Ashley Vandermorris, MD[3], Jennifer Smith, MD[4], Miya Kagan-Cassidy, BA[1], Danielle Giokas, BSc[1], Barbara Fallon, PhD[1]

[1]Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Ontario, Canada, M5S 1V4

[2]Departments of Emergency Medicine & Pediatrics, University of Colorado, Anschutz Medical Campus, Aurora, Colorado, United States, 80045

[3]Division of Adolescent Medicine, The Hospital for Sick Children, 555 University Avenue, Toronto, Ontario, Canada M5G 1X8

[4]Department of Paediatrics, The Hospital for Sick Children, 555 University Avenue, Toronto, Ontario, Canada M5G 1X8

Corresponding Author: Eliza Livingston, Factor-Inwentash Faculty of Social Work, University of Toronto, 246 Bloor St W, Toronto, Ontario, Canada M5S 1V4
Email: eliza.livingston@utoronto.ca
Telephone: 416-300-5513
Fax: 416-978-7072

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What is already known?

- Child maltreatment can have detrimental effects on health.
- Healthcare professionals play an important role in identifying and reporting child maltreatment.
- Healthcare professionals in hospital-based settings are more likely to refer younger children (under 3 years old) to child welfare agencies.

What this study adds?

- Investigations referred by hospital-based providers are more likely to focus on assessing risk of future maltreatment and involve primary caregiver and household risk factors.
- Investigations referred by community-based healthcare professionals are more likely to involve a primary concern of physical abuse.
- Families referred by healthcare professionals are more likely to receive services following an initial investigation if they involve noted primary caregiver risk factors.

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ABSTRACT

Objectives: This study examines the characteristics and outcomes of child welfare investigations referred by hospital and community-based healthcare professionals.

Methods: Data from the Ontario Incidence Study of Reported Child Abuse and Neglect – 2018, a cross-sectional study, were analyzed. Bivariate analyses compared characteristics of hospital and community healthcare-referred investigations. Chi-square Automatic Interaction Detector analyses were used to predict the most influential factors in the decision to provide a family with services following a child welfare investigation from each referral source.

Results: Community healthcare-referred investigations were more likely to have a primary concern of physical abuse while hospital-referred investigations were more likely to be focused on assessing risk of future maltreatment. Hospital-referred investigations were more likely to involve noted primary caregiver (e.g., mental health issues, alcohol/drug abuse, victim of intimate partner violence) and household risk factors. The most significant predictor of service provision following an investigation was having a caregiver who was identified as a victim of IPV in hospital-referred investigations ($\chi2=30.237$, df=1, adj. $p<0.001$) and having a caregiver for whom few social supports was noted in community healthcare-referred investigations ($\chi2=18.892$, df=1, adj. $p<0.001$).

Conclusion: Healthcare professionals likely interact with children who are at high risk for maltreatment. This study's findings highlight the important role that healthcare professionals play in child maltreatment identification, which may differ across hospital and community-based settings and has implications for future collaborations between the healthcare and child welfare systems.

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Key Words: Child Abuse / Social Work

INTRODUCTION

Child maltreatment has detrimental effects on child health [1-2]. Healthcare professionals, as mandatory reporters, are one of the best-positioned groups to identify child maltreatment [3]. This is true across various divisions of the healthcare system; while primary care providers are in frequent and continuous contact with families and may notice the initial signs of maltreatment, hospital-based providers may encounter more severe cases of abuse or neglect [4-6]. Healthcare professionals make up approximately 10% of referrals to child welfare services in Canada and play an important role in protecting vulnerable populations such as infants and young children [4,7-8], children with disabilities [8-9], and children with physical and mental health conditions [8].

Existing literature has explored the characteristics of investigations referred to child welfare by hospital-based providers, including emergency department physicians. Within the Canadian context, an analysis of data from the Ontario Incidence Study of Reported Child Abuse and Neglect 2013 (OIS-2013) revealed that investigations referred by hospital-based providers most often involved concerns for children at risk of future maltreatment, followed by concerns of exposure to intimate partner violence (IPV), neglect, and physical abuse [7]. Investigations that assess whether a child is at risk of future maltreatment are not focused on alleged maltreatment but rather on assessing if risk factors in the child's environment may lead to future maltreatment, including concerns about the caregiver [10]. Hospital-based referrals are frequently initiated because caregivers require acute care for medical needs related to domestic violence, substance abuse or a mental health crisis [11-12]. Studies examining maltreatment concerns originating from emergency departments in the United States show high rates of physical abuse and neglect,

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likely due to severe injury presentation [13-14]. In both the United States and Canada, young children, particularly infants, are more likely to be hospitalized due to severe maltreatment-related injuries [14-17].

Most studies that have examined child welfare referrals from community-based healthcare professionals focus on their attitudes towards and experiences with mandatory reporting [6, 18-20]. One study investigating reports to child welfare from a pediatric clinic found that child developmental concerns, maternal drug use, and maternal depression were the most likely predictors in the decision to make a referral [21].

No study has previously examined how families referred to child welfare by healthcare providers are supported following an initial child welfare investigation. By understanding how the child welfare system intervenes in cases of suspected maltreatment referred by healthcare professionals, we can facilitate collaboration with the child welfare system and provide clinicians with valuable information regarding which families receive services following an investigation.

The OIS-2018 presents an opportunity to understand the characteristics and outcomes of investigations referred to child welfare by the Ontario healthcare system. This paper uses data from the OIS-2018 to 1) examine differences in hospital and community healthcare-referred investigation characteristics and service outcomes (see Table 1 for variable definitions) and 2) identify the family and case characteristics that predict the decision to provide families with services (i.e., ongoing child welfare services or a referral to services external to child welfare) following an initial child welfare investigation reported by hospital and community healthcare workers.

METHODS

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We conducted secondary analyses of data from the OIS-2018, the sixth cycle of a study that examines the incidence rates and characteristics of child welfare investigations in Ontario [22]. Using a standardized online data collection instrument, investigating workers provide information on child, family, and case characteristics as well as short-term service dispositions. This includes an investigation's referral source; the OIS includes categories for referrals from hospitals (including physicians, nurses, and social workers), as well as community health physicians and nurses (referred to herein as "community healthcare referrals"). Both the completion rate and the participation rate for the 2018 cycle were over 99% [10].

The OIS-2018 used a multi-stage sampling design. In the first stage, 18 child welfare agencies were selected using stratified random sampling. In the second stage, cases opened at selected agencies between October 1, 2018 and December 31, 2018 were included. Case information in Ontario is collected at the family level, so in the final stage the investigating worker identified children (under the age of 18) investigated for maltreatment-related concerns. The final sample was weighted to derive estimates of investigation rates for the province. See Fallon [22] for a description of the weighting procedures.

Analysis

Descriptive analyses were conducted to determine the incidence rate of investigations with a hospital or community healthcare referral source. The rate per 1,000 children was calculated by dividing the weighted estimate by the total child population of Ontario and multiplying by 1,000. Bivariate analyses were conducted using chi-square tests to examine the differences between hospital referrals and community healthcare referrals across variables including: maltreatment concern, physical harm, child age, presence of at least one child

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functioning concern, primary caregiver risk factors, household risk factors, and case dispositions. See Table 1 for a description of the variables used in this analysis.

Chi-square Automatic Interaction Detector (CHAID) analysis was then conducted to identify the factors that predict the decision to provide the family with services beyond the initial child welfare investigation (i.e., transfer to ongoing services or make a referral to a non-child welfare service; see Table 1). Two CHAIDs were performed, one for each referral source (i.e., hospital referrals and community healthcare referrals). CHAID is an exploratory, multivariate analysis technique where predictor variables are split into categories using chi-square tests [23]. The dependent variable acts as the root node and is first split into parent nodes, and then into child nodes by selecting the predictor variable that is the most different on the dependent variable. The splitting of the tree continues until the terminal node is reached [23,24]. The minimum sizes for parent (n=50) and child (n=20) nodes were chosen to avoid overfitting the data. The predictor variables used in the two CHAIDs were: maltreatment type, child age, physical harm, presence of at least one child functioning concern, the household running out of money in the last six months for basic necessities, as well as primary caregiver risk factors (alcohol abuse, drug/solvent abuse, mental health issues, few social supports, victim of IPV) noted by the investigating worker. All analyses were conducted in SPSS v27.0.

Patient and Public Involvement

As the OIS collects data from investigating workers, the children and families investigated are not directly involved in the study design, data collection, or reporting processes. Following the completion of each cycle, a report including the study's major findings is made available to the public.

Table 1. Variable definitions

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Variable	**Definition**
Hospital Referral	Refers to investigations where the source of the referral works in a hospital-based setting, including physicians, nurses, and social workers.
Community Healthcare Referral	Refers to investigations where the source of referral is a community healthcare professional, including physicians and nurses.
Household Income	Refers to the caregiver's primary source of income, including full-time, part-time or seasonal employment, as well as insurance and other benefits.
Number of Moves	Refers to the number of times the household has moved in the past year.
Home Overcrowding	Refers to whether the house is overcrowded, based on the opinion of the investigating worker.
Unsafe Housing Conditions	Refers to instances where a worker deemed housing conditions unsafe during the investigation, due to mold, inadequate heating, drug paraphernalia, etc.
Child Age	Refers to the age of the child(ren) living in the home at the time of the investigation.
Ran Out of Money in the Past Six Months	Refers to investigations where the household ran out of money for basic necessities in the past six months (e.g., food, housing, utilities, telephone/cell phone, transportation).
Primary Caregiver Risk Factors	Refers to investigations where workers have indicated that the primary caregiver has a risk factor(s) (e.g., alcohol abuse, drug/solvent abuse, cognitive impairment, mental health issues, physical health issues, few social supports, victim of IPV, perpetrator of IPV, history of foster care/group homes, at least one functioning issue).
At Least One Child Functioning Concern	Refers to investigations where workers have identified at least one child functioning concern (e.g., positive toxicology at birth, FASD, failure to meet developmental milestones, intellectual/developmental disabilities, attachment issues, ADHD, aggression/conduct issues, physical disability, academic/learning difficulties, depression/anxiety/withdrawal, self-harming behaviour, suicidal thoughts, suicide attempts, inappropriate sexual behaviour, running (multiple incidents), alcohol abuse, drug/solvent abuse, Youth Criminal Justice Act or other.
Primary Concern of Investigation	Refers to the primary risk or maltreatment concern identified by the worker, such as physical abuse, sexual abuse, emotional abuse, exposure to IPV, neglect or risk of future maltreatment
Substantiation	Refers to investigations where the maltreatment allegation was confirmed, as opposed to suspected or unfounded.
Physical Harm	Refers to investigations where there was evidence that a child was physically harmed (e.g., bruises, cuts, scrapes, broken bones, burns, head trauma, fatal, or health condition).
Significant Risk of Future Maltreatment	Refers to investigations where workers believed there to be a significant risk that a child would suffer future maltreatment.
Service Referral Made	The family received a service referral following case closure, either internal or external (e.g., parent education or support services, family or parent counselling, drug/alcohol counselling or treatment, psychiatric/mental health services, intimate partner violence services, welfare or social assistance, food bank, shelter services, housing, legal, child victim support services, special education placement,

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	recreational services, medical or dental services, speech/language, child or day care, cultural services, immigration services, or other).
Transfer to Ongoing Services	Refers to instances where following the initial investigation, a worker opted to keep the case open and transfer it to ongoing services.
Placement During Investigation	Refers to instances where a child was placed in out of home care during the investigation.
Case Closed with No Service Referral	Following case closure, no family members received a referral to service external to child welfare and the investigation was not transferred to ongoing services

RESULTS

In Ontario, the incidence rates of investigations in 2018 that were referred by hospital and community healthcare personnel were 3.76 and 1.40 investigations per 1,000 children, respectively (Table 2).

Table 2. Investigations referred by hospital and community-based healthcare professionals in Ontario in 2018.

	Estimate	Rate per 1,000	%
Hospital referrals	8,884	3.761	6%
Community healthcare referrals	3,311	1.402	2.1%
Total referrals	158,477	67.10	100%
Based on a sample of 7,590 child maltreatment-related investigations.			

Table 3 presents the results of the bivariate analyses which compared investigations referred from hospital and community healthcare sources. Investigations referred by community healthcare providers were significantly more likely to involve a physical abuse concern than those referred by hospital-based providers (23% vs. 7%). Investigations with a hospital referral source were significantly more likely to be initiated due to concerns of risk of future maltreatment (59% vs. 36%). Hospital-referred investigations were significantly more likely to have noted physical harm to the child due to maltreatment (i.e., physical abuse, sexual abuse, or neglect) (15% vs. 9%).

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Hospital-referred investigations were also significantly more likely to involve caregivers who received benefits or were unemployed (33% vs. 25%), households that had moved in the past year (29% vs. 16%), and families who lived in homes that the worker indicated were overcrowded (12% vs. 7%) or unsafe (5% vs. 2%).

Children involved in investigations referred by hospital-based providers were significantly more likely to be infants or toddlers (ages 0-3) (42% vs. 26%). Primary caregivers involved in investigations with a hospital referral source were significantly more likely to have noted alcohol abuse, drug/solvent abuse, mental health issues, be a victim of IPV, or have a history of foster care or group homes. At least one primary caregiver risk factor was noted in approximately 70% of investigations referred by both sources.

Approximately half of the investigations referred by both hospital and community healthcare sources were substantiated. Investigations referred by hospital sources were more likely to result in all short-term service dispositions included in the analysis.

Table 3. Bivariate analyses for investigations with hospital and community healthcare referral sources

Characteristics	Hospital Referral		Community Healthcare Referral		X^2 p-value
	#	%	#	%	
Household Income Source					<0.001
Full-Time	3,995	45%	1,628	49%	
Part-Time/Seasonal	1,206	14%	462	14%	
Other Benefits/Unemployment	2,886	33%	826	25%	
Unknown	281	3%	153	5%	
No source of income	516	6%	228	7%	
Number of Moves					<0.001
0	4,525	51%	1,974	60%	
1	1,764	20%	445	14%	
2+	757	9%	71	2%	
Unknown	1,838	21%	808	25%	

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Home Overcrowding					
Yes	1,036	12%	211	7%	<0.001
Unsafe Housing Conditions					
Yes	419	5%	55	2%	<0.001
Ran Out of Money in the Past 6 Months for Basic Necessities					
Yes	819	9%	323	10%	0.365
Primary Caregiver Risk Factors					
Alcohol Abuse	1,008	11%	224	7%	<0.001
Drug/Solvent Abuse	1,697	19%	331	10%	<0.001
Cognitive Impairment	520	6%	203	6%	0.543
Mental Health Issues	3,665	41%	1,252	38%	0.001
Physical Health Issues	603	7%	356	11%	<0.001
Few Social Supports	2,834	32%	1,094	33%	0.203
Victim of IPV	2,572	29%	719	22%	<0.001
Perpetrator of IPV	484	6%	200	6%	0.196
History of Foster Care/Group Home	754	9%	168	5%	<0.001
At least One Functioning Issue	6,052	68%	2,302	70%	0.096
Child Age					<0.001
<1 Year	2,032	23%	389	12%	
1-3 Years	1,651	19%	473	14%	
4-7 Years	1,515	17%	572	17%	
8-11 Years	1,337	15%	941	28%	
12-17 Years	2,349	26%	936	27%	
At Least One Child Functioning Concern					
Yes	3,579	40%	1,171	35%	<0.001
Primary Concern of Investigation					<0.001
Physical Abuse	631	7%	774	23%	
Sexual Abuse	185	2%	84	3%	
Neglect	1,389	16%	530	16%	
Emotional Maltreatment	303	3%	147	4%	
Exposure to IPV	1,101	12%	598	18%	
Risk	5,275	59%	1,179	36%	
Substantiation					<0.001
Unfounded	1,419	39%	1,020	48%	
Suspected	300	8%	67	3%	
Substantiated	1,890	52%	1,045	49%	
Physical Harm					
Yes	522	15%	190	9%	<0.001
Significant Risk of Future Maltreatment					

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Yes	2,664	30%	756	23%	<0.001
Service Referral Made					
Yes	4,201	47%	1,127	34%	<0.001
Transfer to Ongoing Services					
Yes	3,216	36%	847	26%	<0.001
Placement During Investigation					
Yes	914	10%	61	2%	<0.001
Case Closed with No Service Referral					
Yes	3,661	41%	2,000	60%	<0.001

Figure 1 shows the results of the first CHAID, which selected the factors that predict the decision to provide the family with services following an initial child welfare investigation referred by a hospital source. The most significant predictor was that the primary caregiver was noted by the investigating worker to be a victim of IPV ($\chi2 = 30.237$, df = 1, adj. p <0.001), with investigations where this was a concern being significantly more likely to result in further services than investigations where this was not noted (83% vs. 54%). Investigations where a caregiver was identified as both a victim of IPV and had noted drug abuse concerns were the most likely to receive services, with 95% of this subsample being transferred to ongoing services or provided with a service referral.

< Insert Figure 1 here >

Figure 2 shows the results of the second CHAID, which selected the factors that predict the decision to provide services following an initial child welfare investigation referred by a community healthcare source. The most significant predictor of receiving ongoing services or a service referral in these cases was few social supports being noted as a concern for the primary caregiver ($\chi2=18.892$, df = 1, adj. p <0.001). When few social supports was noted as a concern, 67% of investigations involved either a transfer to ongoing services or a referral to a non-child welfare service.

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DISCUSSION

This study compares the characteristics and outcomes of investigations referred to child welfare by hospital and community-based healthcare providers in Canada. The results show that healthcare professionals make up 8% of referrals in Ontario, illustrating their vital role in identifying families in need of support and protecting children who seem to be at an especially high risk for maltreatment. This is also evident by the large proportion, approximately 50%, of hospital and community healthcare-referred investigations that were substantiated. This is double the percentage of total investigations that were substantiated in the OIS-2018 [22]. This could be attributable to multiple factors including the ability of healthcare professionals to provide medical documentation to support allegations of maltreatment, that healthcare providers may see more severe and obvious forms of maltreatment, and that, as trained medical professionals, hospital and community healthcare providers are familiar with typical and atypical injury presentations in children.

The findings of this study reveal the distinctive characteristics of the families referred to child welfare who are served in different healthcare settings. Hospital-referred investigations were significantly more likely to have a primary investigation concern of future risk of maltreatment, likely due to the presence of multiple risk factors across different domains (i.e., primary caregiver and household factors), in addition to the crisis that led them to seek acute care [7,24-25]. The higher percentage of hospital-referred investigations that involved infants also likely contributed to the larger proportion of risk investigations referred by hospitals [24]. The results of the CHAID analysis show that the decision to provide hospital-referred families with additional supports was largely driven by having a primary caregiver who was identified as a

victim of IPV and had noted drug/solvent abuse. Caregivers who are victims of IPV or have substance use concerns have been shown to have higher rates of hospitalization and decreased access of ambulatory care, as have caregivers who experience housing instability [26-28]. It is possible that families referred to child welfare by hospital-based providers may only come into contact with the healthcare system when they are experiencing an acute crisis (e.g., mental health crisis, childbirth, overdose, etc.).

Unlike families referred to child welfare from hospital settings, families who are referred by community healthcare professionals may not be in overt or acute physical or psychological distress due to the ambulatory and preventive nature of these services. The finding that community healthcare professionals were more likely to refer investigations with concerns of physical abuse was unexpected, given the established pattern of hospitalizations due to physical abuse related injuries in the United States' literature [14]. However, studies have shown that pediatricians and primary care physicians are more comfortable reporting cases with injuries indicative of physical abuse than other types of maltreatment, which may contribute to the high proportion of physical abuse concerns [4,29]. As community healthcare providers assess children on a routine basis, they are well-positioned to identify sentinel injuries (relatively minor injuries such as bruises) that may raise concerns of child maltreatment and allow for early intervention [30]. The CHAID analysis showed that the primary reason families referred by community healthcare professionals received services following an investigation was due to the primary caregiver's lack of social supports. As healthcare is universally available in Canada, their community healthcare provider is likely one of the few, if only, supports an isolated family can access. This positions community healthcare providers well to intervene and help establish additional supports for these families.

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Following an initial child welfare investigation, hospital-referred families were significantly more likely to receive services than those referred by community healthcare professionals. As families who are referred by hospitals may be experiencing an acute crisis and require immediate support, it is possible that their needs are prioritized in a child welfare setting over families referred by community healthcare sources.

As the OIS-2018 is a cross-sectional study of child welfare investigations, the data are unable to support causal assumptions or track the long-term outcomes of the families investigated. The OIS only includes cases reported to and investigated by the child welfare system; cases that are unreported or screened out are not included. The child and caregiver risk factors are based on the clinical judgement of the investigating worker, and not diagnosed by a clinician. Due to the weighting procedures used to determine annual provincial estimates it is important to note that the weighting only corrects for seasonal fluctuations in investigation volume, and not for the type of investigation.

The findings of this study show that healthcare professionals in hospital and community-based settings see a specific subset of higher-risk children and that investigations from these sources often involve caregivers with many identified risk factors. This provides valuable information to healthcare professionals regarding the families they serve, which will help practitioners meet the needs of their patients and make a referral to child welfare when they suspect child maltreatment. A significant proportion of families (40-60%) are left without support following investigations initiated by both referral sources. Future research is needed to determine how the Ontario healthcare and child welfare systems can collaborate to support families prior to and following a report to child welfare. It is of critical importance to identify

early effective strategies and interventions to support families, promote skills and address mental health needs.

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Data Availability Statement: The dataset used and analyzed during the current study may be made available in collaboration with Dr. Barbara Fallon, study co-author and the Principal Investigator of the OIS-2018, on reasonable request.

Figure 1. Provision of ongoing services or a service referral in child maltreatment-related investigations referred by a hospital-based healthcare provider.

Figure 2. Provision of ongoing services or a service referral in child maltreatment-related investigations referred by a community-based healthcare provider.

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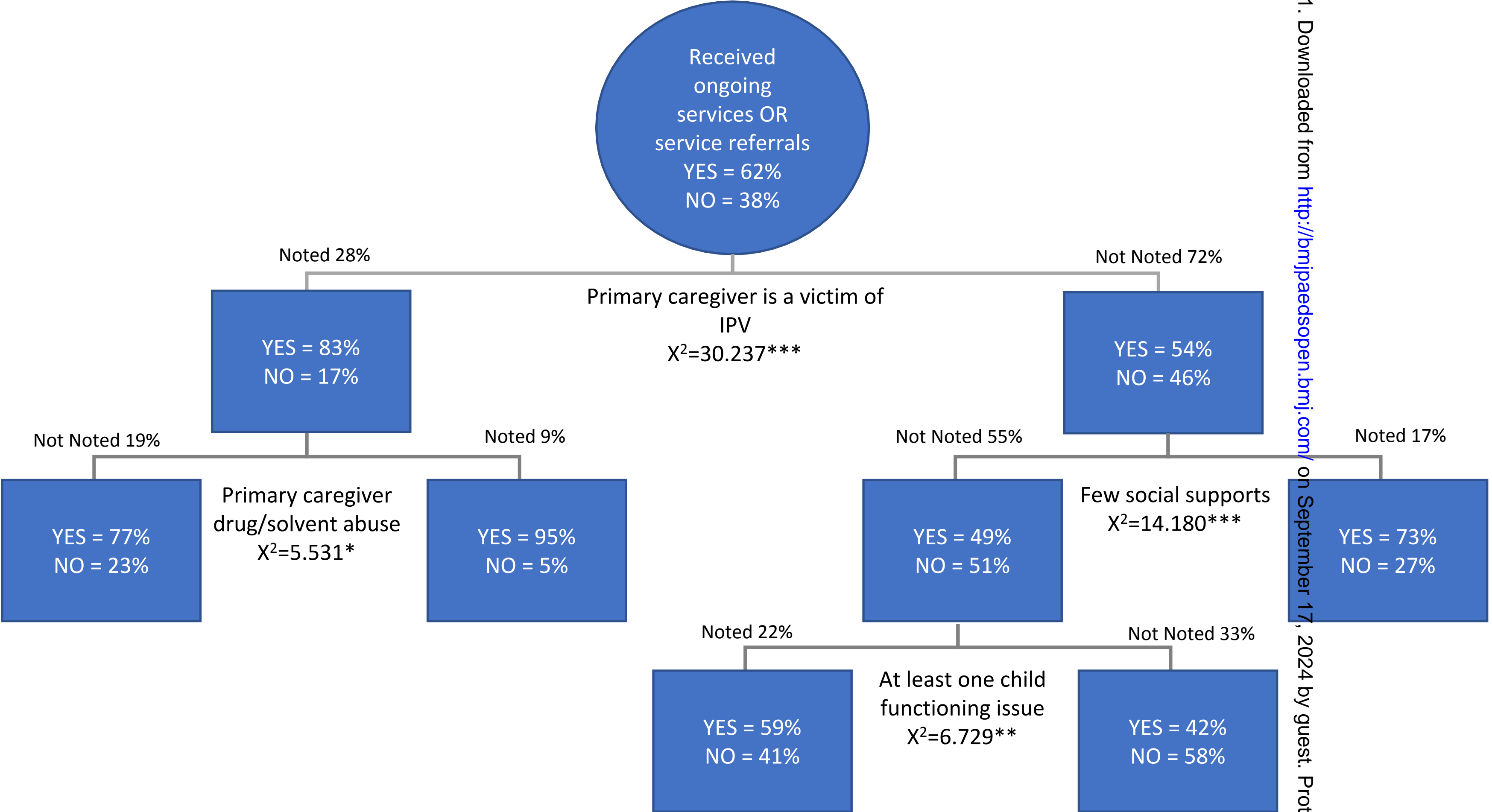

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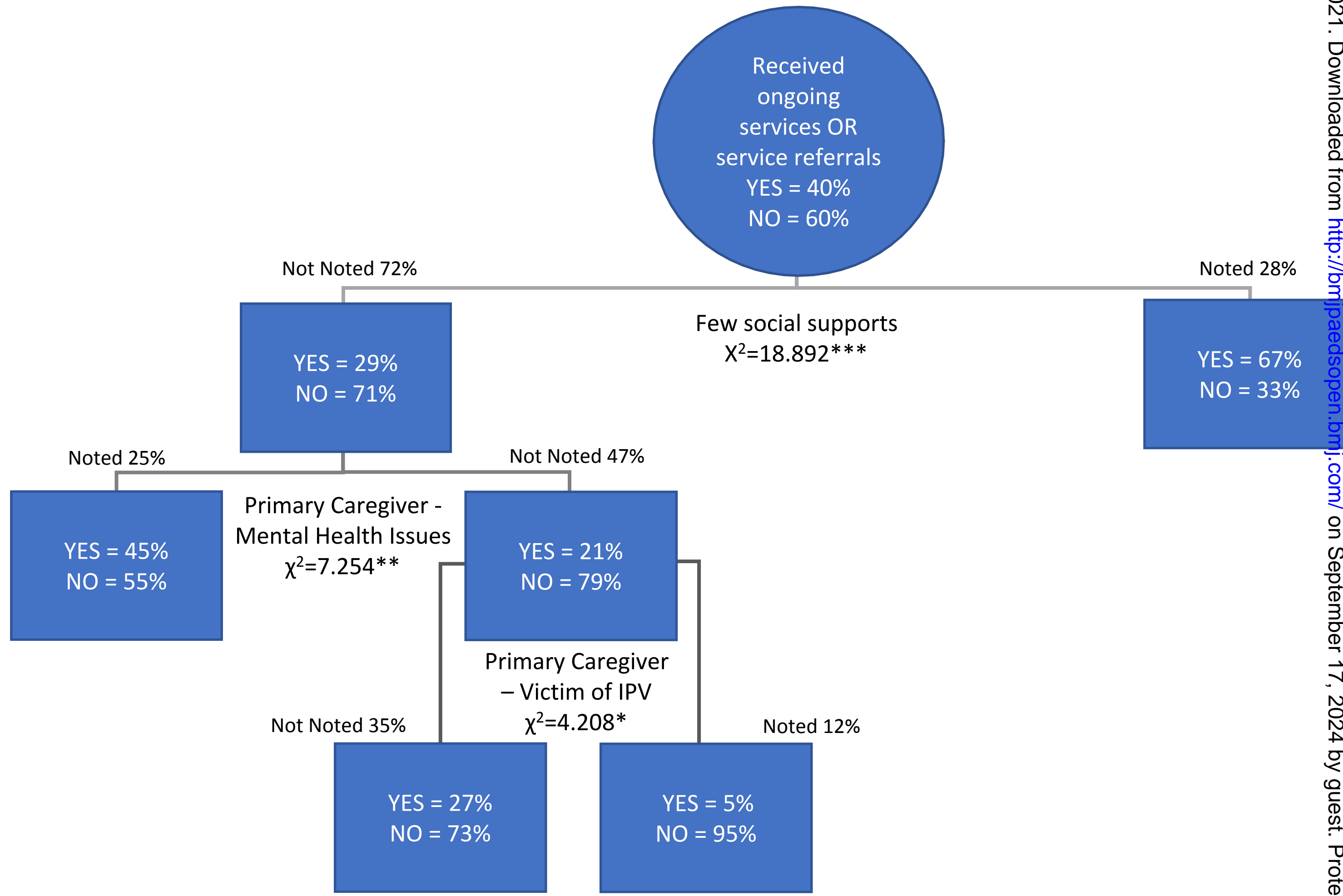

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Characteristics of child welfare investigations reported by healthcare professionals in Ontario: Secondary analysis of a regional database

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Characteristics of child welfare investigations reported by healthcare professionals in Ontario: Secondary analysis of a regional database

Eliza Livingston, BSc[1], Nicolette Joh-Carnella, BA[1], Daniel M. Lindberg, MD[2], Ashley Vandermorris, MD[3], Jennifer Smith, MD[4], Miya Kagan-Cassidy, BA[1], Danielle Giokas, BSc[1], Barbara Fallon, PhD[1]

[1]Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Ontario, Canada, M5S 1V4

[2]Departments of Emergency Medicine & Pediatrics, University of Colorado, Anschutz Medical Campus, Aurora, Colorado, United States, 80045

[3]Division of Adolescent Medicine, The Hospital for Sick Children, 555 University Avenue, Toronto, Ontario, Canada M5G 1X8

[4]Department of Paediatrics, The Hospital for Sick Children, 555 University Avenue, Toronto, Ontario, Canada M5G 1X8

Corresponding Author: Eliza Livingston, Factor-Inwentash Faculty of Social Work, University of Toronto, 246 Bloor St W, Toronto, Ontario, Canada M5S 1V4
Email: eliza.livingston@utoronto.ca
Telephone: 416-300-5513
Fax: 416-978-7072

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What is already known?

- Child maltreatment can have detrimental effects on health.
- Healthcare professionals play an important role in identifying and reporting child maltreatment.
- Healthcare professionals in hospital-based settings are more likely to report younger children (under 3 years old) to child welfare agencies.

What this study adds?

- Investigations reported by hospital-based providers are more likely to focus on assessing risk of future maltreatment and involve primary caregiver and household risk factors.
- Investigations reported by community-based healthcare professionals are more likely to involve a primary concern of physical abuse.
- Families reported by healthcare professionals are more likely to receive services following an initial investigation if they involve noted primary caregiver risk factors.

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ABSTRACT

Objectives: This study examines the characteristics and outcomes of child welfare investigations reported by hospital and community-based healthcare professionals.

Methods: A sample of 7,590 child maltreatment-related investigations from the Ontario Incidence Study of Reported Child Abuse and Neglect – 2018, a cross-sectional study, were analyzed. Bivariate analyses compared characteristics of hospital and community healthcare-reported investigations. Chi-square Automatic Interaction Detector analyses were used to predict the most influential factors in the decision to provide a family with services following a child welfare investigation from each referral source.

Results: Community healthcare-reported investigations were more likely to have a primary concern of physical abuse while hospital-reported investigations were more likely to be focused on assessing risk of future maltreatment. Hospital-reported investigations were more likely to involve noted primary caregiver (e.g., mental health issues, alcohol/drug abuse, victim of intimate partner violence) and household risk factors. The most significant predictor of service provision following an investigation was having a caregiver who was identified as a victim of IPV in hospital-reported investigations ($\chi2=30.237$, df=1, adj. $p < 0.001$) and having a caregiver for whom few social supports was noted in community healthcare-reported investigations ($\chi2=18.892$, df=1, adj. $p < 0.001$).

Conclusion: Healthcare professionals likely interact with children who are at high risk for maltreatment. This study's findings highlight the important role that healthcare professionals play in child maltreatment identification, which may differ across hospital and community-based settings and has implications for future collaborations between the healthcare and child welfare systems.

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Key Words: Child Abuse / Social Work

INTRODUCTION

Child maltreatment has detrimental effects on child health [1-2]. Healthcare professionals, as mandatory reporters, are one of the best-positioned groups to identify child maltreatment [3]. This is true across various divisions of the healthcare system; while primary care providers are in frequent and continuous contact with families and may notice the initial signs of maltreatment, hospital-based providers may encounter more severe cases of abuse or neglect [4-6]. Healthcare professionals make up approximately 10% of reports to child welfare services in Canada and play an important role in protecting vulnerable populations such as infants and young children [4,7-8], children with disabilities [8-9], and children with physical and mental health conditions [8]. Further, investigations reported to child welfare by healthcare professionals are more likely to be substantiated than reports from non-professional sources (e.g., relatives, community members, etc.) [10].

Existing literature has explored the characteristics of investigations reported to child welfare by hospital-based providers, including emergency department physicians. Within the Canadian context, an analysis of data from the Ontario Incidence Study of Reported Child Abuse and Neglect 2013 (OIS-2013) revealed that investigations reported by hospital-based providers most often involved concerns for children at risk of future maltreatment, followed by concerns of exposure to intimate partner violence (IPV), neglect, and physical abuse [7]. Investigations that assess whether a child is at risk of future maltreatment are not focused on alleged maltreatment but rather on assessing if risk factors in the child's environment may lead to future maltreatment, including concerns about the caregiver [11]. Hospital-based reports are often initiated because caregivers require acute care for medical needs related to domestic violence, substance abuse or

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a mental health crisis [12-13]. Studies examining maltreatment concerns originating from emergency departments in the United States show high rates of physical abuse and neglect, likely due to severe injury presentation [14-15]. In both the United States and Canada, young children, particularly infants, are more likely to be hospitalized due to severe maltreatment-related injuries [15-18].

Most studies that have examined child welfare reports from community-based healthcare professionals focus on their attitudes towards and experiences with mandatory reporting [6, 19-21]. One study investigating reports to child welfare from a pediatric clinic found that child developmental concerns, maternal drug use, and maternal depression were the most likely predictors in the decision to report [22].

The OIS-2018 presents an opportunity to understand the characteristics and outcomes of investigations reported to Ontario child welfare by the healthcare system. In Ontario, every citizen has a duty to report child maltreatment to child welfare; healthcare providers are particularly responsible as failure to do so may result in a fine [23]. Reports are screened by the local child welfare agency to determine whether they meet the criteria to be opened for an investigation. Mandated child welfare agencies in Ontario operate under a decentralized model, but all are governed by provincial child protection legislation, the Child, Youth and Family Services Act [11].

This paper uses data from the OIS-2018 to 1) compare characteristics and service outcomes in hospital and community healthcare-reported investigations (see Table 1 for variable definitions) and 2) identify the family and case characteristics that predict the decision to provide families with services (i.e., ongoing child welfare services or a referral to services external to

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child welfare) following an initial child welfare investigation reported by hospital and community healthcare workers.

METHODS

We conducted secondary analyses of data from the OIS-2018, the sixth cycle of a study that examines the incidence rates and characteristics of child welfare investigations in Ontario [24]. Using a standardized online data collection instrument, investigating workers provide information on child, family, and case characteristics, and short-term service dispositions. This includes an investigation's referral source, with categories for reports from hospitals (such as physicians, nurses, and social workers), and community health physicians and nurses (referred to herein as "community healthcare reports"). Both the completion rate and the participation rate for the 2018 cycle were over 99% [11].

The OIS-2018 used a multi-stage sampling design. In the first stage, 18 child welfare agencies were selected from a sampling frame of 48 agencies using stratified random sampling. In the second stage, cases opened at selected agencies between October 1, 2018 and December 31, 2018 were included. Case information in Ontario is collected at the family level, so in the final stage the investigating worker identified children (under the age of 18) investigated for maltreatment-related concerns. The OIS received ethics approval from the University of Toronto (protocol #28580). The final sample, which included 7,590 child maltreatment-related investigations, was weighted to derive estimates of investigation rates for the province. See Fallon [24] for a description of the weighting procedures.

Analysis

Descriptive analyses were conducted to determine the incidence rate of investigations with a hospital or community healthcare referral source. The rate per 1,000 children was

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calculated by dividing the weighted estimate by the total child population of Ontario and multiplying by 1,000. Bivariate analyses were conducted using chi-square tests to examine the differences between hospital and community healthcare reports across variables including: maltreatment concern, physical harm, child age, presence of at least one child functioning concern, primary caregiver risk factors, household risk factors, and case dispositions. The case dispositions captured in the OIS-2018 are not mutually exclusive. See Table 1 for a description of the variables used in this analysis.

Chi-square Automatic Interaction Detector (CHAID) analysis was then conducted to identify the factors that predict the decision to provide the family with services beyond the initial child welfare investigation (i.e., transfer to ongoing services or make a referral to a non-child welfare service; see Table 1). Two CHAIDs were performed, one for hospital reports and one for community healthcare reports. CHAID is an exploratory, multivariate analysis technique where predictor variables are split into categories using chi-square tests [25]. All variables start in the root node which is then split to maximize the difference in the dependent variable. The splitting of the tree continues until the terminal node is reached [25,26]. To avoid overfitting the data, the minimum sizes for parent (n=50) and child (n=20) nodes were chosen to halt tree growth [27]. The predictor variables used in the two CHAIDs were: maltreatment type, child age, physical harm, presence of at least one child functioning concern, the household running out of money in the last six months for basic necessities, as well as primary caregiver risk factors (alcohol abuse, drug/solvent abuse, mental health issues, few social supports, victim of IPV) noted by the investigating worker. All analyses were conducted in SPSS v27.0.

Patient and Public Involvement

As the OIS collects data from investigating workers, the children and families investigated are not directly involved in the study design, data collection, or reporting processes. Following the completion of each cycle, a report including the study's major findings is made available to the public.

Table 1. Variable definitions

Variable	Definition
Hospital Report	Refers to investigations where the source of the report works in a hospital-based setting, such as physicians, nurses, and social workers.
Community Healthcare Report	Refers to investigations where the source of the report is a community healthcare professional, including physicians and nurses.
Household Income	Refers to the caregiver's primary source of income, including full-time, part-time or seasonal employment, as well as insurance and other benefits.
Number of Moves	Refers to the number of times the household has moved in the past year.
Home Overcrowding	Refers to whether the house is overcrowded, based on the opinion of the investigating worker.
Unsafe Housing Conditions	Refers to instances where a worker deemed housing conditions unsafe during the investigation, due to mold, inadequate heating, drug paraphernalia, etc.
Child Age	Refers to the age of the child(ren) living in the home at the time of the investigation.
Ran Out of Money in the Past Six Months	Refers to investigations where the household ran out of money for basic necessities in the past six months (i.e., food, housing, utilities, telephone/cell phone, transportation).
Primary Caregiver Risk Factors	Refers to investigations where workers have indicated that the primary caregiver has a risk factor(s) (i.e., alcohol abuse, drug/solvent abuse, cognitive impairment, mental health issues, physical health issues, few social supports, victim of IPV, perpetrator of IPV, history of foster care/group homes, at least one functioning issue).
At Least One Child Functioning Concern	Refers to investigations where workers have identified at least one child functioning concern (i.e., positive toxicology at birth, FASD, failure to meet developmental milestones, intellectual/developmental disabilities, attachment issues, ADHD, aggression/conduct issues, physical disability, academic/learning difficulties, depression/anxiety/withdrawal, self-harming behaviour, suicidal thoughts, suicide attempts, inappropriate sexual behaviour, running (multiple incidents), alcohol abuse, drug/solvent abuse, Youth Criminal Justice Act or other.)
Primary Concern of Investigation	Refers to the primary risk or maltreatment concern identified by the worker, including physical abuse, sexual abuse, emotional abuse, exposure to IPV, neglect or risk of future maltreatment
Substantiation	Refers to investigations where the investigating worker concluded, based on available evidence, that the child was a victim of maltreatment.

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Physical Harm	Refers to investigations where there was evidence that a child was physically harmed (i.e., bruises, cuts, scrapes, broken bones, burns, head trauma, fatal, or health condition).
Significant Risk of Future Maltreatment	Refers to investigations where workers believed there to be a significant risk that a child would suffer future maltreatment.
Service Referral Made	The family received a service referral following the initial investigation, either internal or external to the child welfare agency (i.e., parent education or support services, family or parent counselling, drug/alcohol counselling or treatment, psychiatric/mental health services, intimate partner violence services, welfare or social assistance, food bank, shelter services, housing, legal, child victim support services, special education placement, recreational services, medical or dental services, speech/language, child or day care, cultural services, immigration services, or other).
Transfer to Ongoing Services	Refers to instances where, following the initial investigation, a worker opted to keep the case open and transfer it to ongoing services.
Placement During Investigation	Refers to instances where a child was placed in out of home care during the investigation.
Case Closed with No Additional Services Provided	Following the initial investigation, no family members received a referral to services external to child welfare and the case was not transferred to ongoing services.

RESULTS

In the OIS-2018 sample, 441 and 162 investigations were reported by hospital and community-based healthcare providers between October and December 2018, respectively. The remaining 6,987 reports were made by other professional (e.g., schools, police, etc.) and non-professional sources (e.g., relatives, neighbours, etc.). The estimated incidence rates were 3.76 investigations reported by hospital providers and 1.40 investigations reported by community-based healthcare providers per 1,000 children in Ontario (Table 2).

Table 2. Investigations reported by hospital and community-based healthcare professionals in Ontario in 2018.

	Estimate	Rate per 1,000	%
Hospital reports	8,884	3.76	6%
Community healthcare reports	3,311	1.40	2%
Other reports	146,282	61.93	92%

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Total reports	158,477	67.10	100%
Based on a sample of 7,590 child maltreatment-related investigations.			

Table 3 presents the results of the bivariate analyses which compared investigations reported from hospital and community healthcare sources. Investigations reported by community healthcare providers were significantly more likely to involve a physical abuse concern than those reported by hospital-based providers (23% vs. 7%). Investigations with a hospital referral source were significantly more likely to be initiated due to concerns of risk of future maltreatment (59% vs. 36%). Hospital-reported investigations were significantly more likely to have noted physical harm to the child (15% vs. 9%).

Hospital-reported investigations were also significantly more likely to involve caregivers who received benefits as their primary source of income or were unemployed (33% vs. 25%), households that had moved in the past year (29% vs. 16%), and families who lived in homes that the worker indicated were overcrowded (12% vs. 7%) or unsafe (5% vs. 2%).

Children involved in investigations reported by hospital-based providers were significantly more likely to be infants or toddlers (ages 0-3; 42% vs. 26%). Primary caregivers involved in investigations with a hospital referral source were significantly more likely to have noted alcohol abuse (11% vs. 7%), drug/solvent abuse (19% vs. 10%), mental health issues (41% vs. 38%), be a victim of IPV (29% vs. 22%) or have a history of being in foster care or group homes (9% vs. 5%). At least one primary caregiver risk factor was noted in approximately 70% of investigations reported by both sources.

Approximately half of the investigations reported by both hospital and community healthcare sources were substantiated. Investigations reported by hospital sources were more likely to result in all short-term service dispositions included in the analysis.

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Table 3. Bivariate analyses for investigations with hospital and community healthcare referral sources

Characteristics	Hospital Referral		Community Healthcare Referral		X^2 p-value
	#	%	#	%	
Household Income Source					<0.001
Full-Time	3,995	45%	1,628	49%	
Part-Time/Seasonal	1,206	14%	462	14%	
Other Benefits/Unemployment	2,886	33%	826	25%	
Unknown	281	3%	153	5%	
No source of income	516	6%	228	7%	
Number of Moves					<0.001
0	4,525	51%	1,974	60%	
1	1,764	20%	445	14%	
2+	757	9%	71	2%	
Unknown	1,838	21%	808	25%	
Home Overcrowding					
Yes	1,036	12%	211	7%	<0.001
Unsafe Housing Conditions					
Yes	419	5%	55	2%	<0.001
Ran Out of Money in the Past 6 Months for Basic Necessities					
Yes	819	9%	323	10%	0.365
Primary Caregiver Risk Factors					
Alcohol Abuse	1,008	11%	224	7%	<0.001
Drug/Solvent Abuse	1,697	19%	331	10%	<0.001
Cognitive Impairment	520	6%	203	6%	0.543
Mental Health Issues	3,665	41%	1,252	38%	0.001
Physical Health Issues	603	7%	356	11%	<0.001
Few Social Supports	2,834	32%	1,094	33%	0.203
Victim of IPV	2,572	29%	719	22%	<0.001
Perpetrator of IPV	484	6%	200	6%	0.196
History of Foster Care/Group Home	754	9%	168	5%	<0.001
At least One Functioning Issue	6,052	68%	2,302	70%	0.096
Child Age					<0.001
<1 Year	2,032	23%	389	12%	
1-3 Years	1,651	19%	473	14%	
4-7 Years	1,515	17%	572	17%	
8-11 Years	1,337	15%	941	28%	

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12-17 Years	2,349	26%	936	27%	
At Least One Child Functioning Concern					
Yes	3,579	40%	1,171	35%	<0.001
Primary Concern of Investigation					<0.001
Physical Abuse	631	7%	774	23%	
Sexual Abuse	185	2%	84	3%	
Neglect	1,389	16%	530	16%	
Emotional Maltreatment	303	3%	147	4%	
Exposure to IPV	1,101	12%	598	18%	
Risk	5,275	59%	1,179	36%	
Substantiation					<0.001
Unfounded	1,419	39%	1,020	48%	
Suspected	300	8%	67	3%	
Substantiated	1,890	52%	1,045	49%	
Physical Harm					
Yes	522	15%	190	9%	<0.001
Significant Risk of Future Maltreatment					
Yes	2,664	30%	756	23%	<0.001
Service Referral Made					
Yes	4,201	47%	1,127	34%	<0.001
Transfer to Ongoing Services					
Yes	3,216	36%	847	26%	<0.001
Placement During Investigation					
Yes	914	10%	61	2%	<0.001
Case Closed with No Additional Services					
Yes	3,661	41%	2,000	60%	<0.001

Figure 1 shows the results of the first CHAID, which selected the factors that predict the decision to provide the family with services following an initial child welfare investigation reported by a hospital source. The most significant predictor was that the primary caregiver was noted by the investigating worker to be a victim of IPV ($\chi2 = 30.237$, df = 1, adj. $p < 0.001$), with investigations where this was a concern being significantly more likely to result in further services than investigations where this was not noted (83% vs. 54%). Investigations where a caregiver was identified as both a victim of IPV and had noted drug abuse concerns were the

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most likely to receive services, with 95% of this subsample being transferred to ongoing services or provided with a service referral.

< Insert Figure 1 here >

Figure 2 shows the results of the second CHAID, which selected the factors that predict the decision to provide services following an initial child welfare investigation reported by a community healthcare source. The most significant predictor of receiving ongoing services or a service referral in these cases was few social supports being noted as a concern for the primary caregiver ($\chi2=18.892$, $df = 1$, adj. $p <0.001$). When few social supports was noted as a concern, 67% of investigations involved either a transfer to ongoing services or a referral to a non-child welfare service.

< Insert Figure 2 here >

DISCUSSION

This study compares the characteristics and outcomes of investigations reported to child welfare by hospital and community-based healthcare providers in Ontario, Canada. The results show that healthcare professionals make up 8% of reports in Ontario, illustrating their vital role in identifying families in need of support and protecting children who seem to be at an especially high risk for maltreatment. This is also evident by the large proportion, approximately 50%, of hospital and community healthcare-reported investigations that were substantiated. This is double the percentage of total investigations that were substantiated in the OIS-2018 [24]. This could be attributable to multiple factors including that healthcare professionals can provide medical documentation to support maltreatment allegations [10], may see more severe and obvious forms of maltreatment [8,15,28], and as trained medical professionals, are familiar with typical and atypical injury presentations in children [29-30].

The findings of this study reveal the distinctive characteristics of the families reported to child welfare who are served in different healthcare settings. Hospital-reported investigations were significantly more likely to have a primary investigation concern of future risk of maltreatment, likely due to the presence of multiple risk factors across different domains (i.e., primary caregiver and household factors), in addition to the crisis that led them to seek acute care [7,26,31]. The higher percentage of hospital-reported investigations that involved infants also likely contributed to the larger proportion of risk investigations reported by hospitals [26]. The results of the CHAID analysis show that the decision to provide hospital-reported families with additional supports was largely driven by having a primary caregiver who was identified as a victim of IPV and had noted drug/solvent abuse. Caregivers who are victims of IPV or have substance use concerns have been shown to have higher rates of hospitalization and decreased access of ambulatory care, as have caregivers who experience housing instability [32-34]. It is possible that families reported to child welfare by hospital-based providers may only come into contact with the healthcare system when they are experiencing an acute crisis (e.g., mental health crisis, childbirth, overdose, etc.).

Unlike families reported to child welfare from hospital settings, families who are reported by community healthcare professionals may not be in overt or acute physical or psychological distress due to the ambulatory and preventive nature of these services. The finding that community healthcare professionals were more likely to report investigations with concerns of physical abuse was unexpected, given the established pattern of hospitalizations due to physical abuse-related injuries in American literature [15]. However, studies have shown that pediatricians and primary care physicians are more comfortable reporting cases with injuries indicative of physical abuse than other types of maltreatment, which may contribute to the high

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proportion of physical abuse concerns [4,29]. As community healthcare providers assess children on a routine basis, they are well-positioned to identify sentinel injuries (relatively minor injuries such as bruises) that may raise concerns of child maltreatment and allow for early intervention [35]. The CHAID analysis showed that the primary reason families reported by community healthcare professionals received services following an investigation was due to the primary caregiver's lack of social supports. As healthcare is universally available in Canada, their community healthcare provider is likely one of the few, if only, supports an isolated family can access. This positions community healthcare providers well to intervene and help establish additional supports for these families.

Following an initial child welfare investigation, hospital-reported families were significantly more likely to receive services than those reported by community healthcare professionals. As families who are reported by hospitals may be experiencing an acute crisis and require immediate support, it is possible that their needs are prioritized in a child welfare setting over families reported by community healthcare sources.

The OIS-2018 is a cross-sectional study of child welfare investigations and so the data are unable to support causal assumptions or track the long-term outcomes of the families investigated. The OIS only includes cases reported to and investigated by the child welfare system; cases that are unreported or screened out are not included. The child and caregiver risk factors are based on the clinical judgement of the investigating worker and not diagnosed by a clinician. It is important to note that the weighting only corrects for seasonal fluctuations in investigation volume, and not for the type of investigation when determining annual estimates.

The findings of this study show that healthcare professionals in hospital and community-based settings see a specific subset of higher-risk children and that investigations from these

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sources often involve caregivers with many identified risk factors. This information will help healthcare professionals support their patients including making a report to child welfare when they suspect maltreatment. Further, the findings can help child welfare workers develop informed responses to reports from healthcare sources. This will facilitate improved collaboration between the Ontario healthcare and child welfare systems to support families.

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Contributors: BF conceptualized and supervised the paper. EL synthesized the literature. EL and NJ-C conducted data analyses, data interpretation, and wrote the manuscript with assistance from MK-C and DG. BF, DL, AV, and JS contributed to data interpretation. All authors had input into the manuscript. All authors read and approved the final draft.

Competing Interests: All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Two of the authors disclosed that they have received payment for providing expert testimony regarding child abuse and neglect.

Data Availability Statement: The dataset used and analyzed during the current study may be made available in collaboration with Dr. Barbara Fallon, study co-author and the Principal Investigator of the OIS-2018, on reasonable request.

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Figure 1. Provision of ongoing services or a service referral in child maltreatment-related investigations reported by a hospital-based healthcare provider.

Figure 2. Provision of ongoing services or a service referral in child maltreatment-related investigations reported by a community-based healthcare provider.

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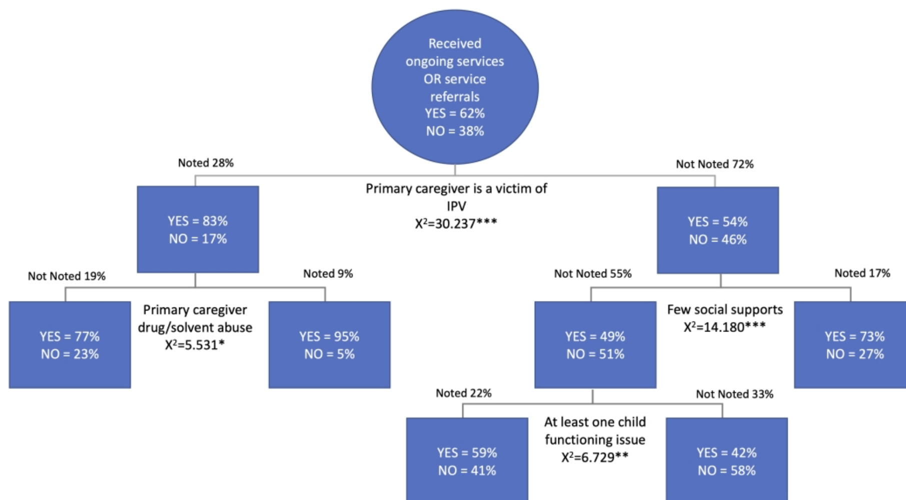

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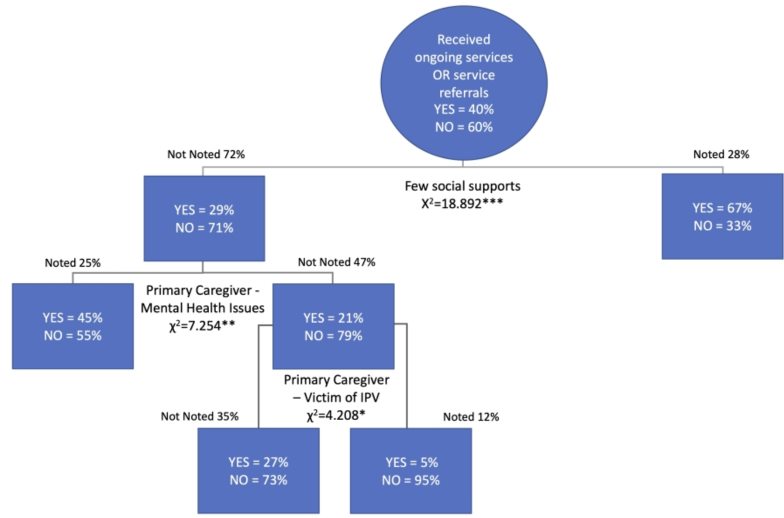

338x190mm (300 x 300 DPI)

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