Secular Trends in Incidence, Modality and Mortality with Dialysis-Requiring AKI in Children in Ontario

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Short title: Dialysis-Receiving AKI Among Children

Supplemental Table of Contents:

Supplemental Table 1: ICES databases used for cohort creation, outcomes and baseline characteristics

Database	Details
CIHI-DAD (Discharge Abstract Database)	Contains information on acute hospitalizations, and was used to identify the presence of AKI, and receipt of acute dialysis, as well as in-patient comorbidities and procedures at baseline.
Registered Persons Database (RPDB)	Contains health care identifiers and demographic information for or all eligible individuals in Ontario, as well as a date of death.
Ontario Health Insurance Plan (OHIP) database	Contains records of all physician billings for outpatient and inpatient services in the province.
Canadian Organ Replacement Register (CORR)	Contains information on chronic dialysis and transplantation for all individuals in Canada.
MOMBABY	Contains all inpatient admission records for mothers and their newborns and links mothers and their newborns deterministically based on the maternal/newborn chart number.

Supplemental Table 2: Administrative data codes used in the study to identify children receiving dialysis for AKI

HD codes	**Acute Dialysis Codes** CIHI-DAD Procedure / Intervention Codes 5195: Hemodialysis (CCP) 1PZ21HQBR: hemodialysis (CCI) OHIP Fee Codes R849: initial and acute HD (both medical and surgical components) G323: Dialysis- haemodialysis- acute, repeat (max 3) G325- HD, medical component alone **Access Codes** OHIP Fee Codes G324: Dialysis- haemodialysis- subclavian or jugular catheter for HD G336: Dialysis- revision of G324 G327: insertion of femoral catheter for HD G099: hemodialysis-insert of subclavian or perm. jugular catheter R848: critical care dialysis cannula insertion under vision G312: thrombolytic instillation into temporary or permanent catheter
PD codes	**Acute Dialysis Codes** CIHI-DAD Procedure / Intervention Codes 6698: Peritoneal dialysis (CCP) 1PZ21HPD4: Dialysis, peritoneal dialysis using dialysate (CCI) OHIP Fee Codes G330: Peritoneal dialysis - Acute (up to 48 hrs) G331: Peritoneal dialysis - Repeat acute (up to 48 hrs) max. 3 **Access Codes** CIHI-DAD Procedure / Intervention Codes 1OT53DATS: Implantation of internal device, abdominal cavity, of catheter (peritoneal dialysis) using endoscopic (laparoscopic) approach (CCI) 1OT53HATS: Implantation of internal device, abdominal cavity, of catheter (peritoneal dialysis) using percutaneous (incision) approach (CCI) 1OT53LATS: Implantation of internal device, abdominal cavity, of catheter (peritoneal dialysis) using open (laparotomy) approach (CCI) OHIP Fee Codes R852: Peritoneal dialysis - insert peritoneal cannula by laparotomy R853: Peritoneal dialysis - insert peritoneal cannula by laparotomy

CKRT codes	**Acute Dialysis Codes:** CIHI-DAD Procedure / Intervention Codes 1PZ21HQBS: Dialysis, continuous venovenous hemodialysis (CCI) OHIP Fee Codes G082: Cont.venovenous haemodiafiltration- initial and acute G083: Cont.venovenous haemodialysis- initial and acute G085: Cont.venovenous haemofiltration- initial and acute G090: Venovenous slow cont.ultrafiltration- initial and acute G091: Cont.arteriovenous haemodialysis-intial and acute G092: Cont.arteriovenous haemodiafiltrat'n- initial and acute G093: Haemodiaflitration-contin. Initial & Acute G095: Slow continuous ultrafiltration- initial & acute G294: Arteriovenous slow cont. ultrafiltration- Initial & acute G295: Cont. arteriovenous-haemofiltration- intial and acute)

CIHI-DAD: Canadian Institutes for Health Information's Discharge Abstract Database
CCI: Canadian Classification of Interventions
CCP: Canadian Classification of Procedures
CKRT: Chronic Kidney Replacement Therapy
HD: Hemodialysis
OHIP: Ontario Health Insurance Plan
PD: Peritoneal Dialysis

Supplemental Table 3: Proportion of neonates and children with dialysis-receiving AKI in various time-periods stratified by the cardiac surgery status

	Neonates			Children			
	1996-2001	**2002-2008**	**2009-2015**	**1996-2001**	**2002-2005**	**2006-2009**	**2010-2015**
Cardiac surgery							
At least one acute dialysis (HD, PD, CKRT) code[1]	17 (100%)	35 (14%)	54 (45%)	30 (83%)	43 (45%)	54 (68%)	122 (79%)
HD access code & no acute dialysis code*	0	0	0	0	0	0	0
PD access code & no acute dialysis code*	0	215 (86%)	67 (55%)	6 (17%)	52 (55%)	25 (32%)	32 (21%)
* no code small cell							
No cardiac surgery							
At least one acute dialysis (HD, PD, CKRT) code	>35	31 (54%)	38 (84%)	>460	163 (94%)	156 (92%)	212 (96%)
HD access code & no acute dialysis code*	0	0	0	0	11 (6%)	13 (8%)	0
PD access code & no acute dialysis code*	<6	26 (46%)	7 (16%)	<6			9 (4%)

[1]For acute dialysis and access codes, please see Supplemental Table 2 above.

CKRT: Chronic Kidney Replacement Therapy
HD: Hemodialysis
PD: Peritoneal Dialysis

Supplemental Table 4: Most prevalent diagnoses during a hospital stay for children who received dialysis for AKI in Ontario between April 1, 1996 and March 31, 2015

Most prevalent diagnoses during hospital stay, n (%)	1996-2001	2002-2005	2006-2009	2010-2014
Total	502	269	248	375
1. Acute appendicitis	155 30.9%			
Congenital malformations of cardiac septa		33 12.3%	25 10.1%	84 22.4%
2. Acquired hemolytic anemias	47 9.4%	29 10.8%		27 7.2%
Acute renal failure			23 9.3%	
3. Non-inflammatory disorders of ovary fallopian tube and broad ligament	22 4.4%			
Congenital malformations of cardiac chambers and connections		22 8.2%		
Acquired haemolytic anaemia			21 8.5%	
Acute renal failure				17 4.5%
4. Anomalies of bulbus cordis and cardiac septal closure	22 4.4%			
Acute renal failure		19 7.1%		
Congenital malformations of cardiac chambers and connections			12 4.8%	11 2.9%
5. Benign neoplasm of ovary	18 3.6%			
Other septicaemia		8 3.0%	7 2.8%	
Lymphoid Leukemia				
Streptococcal septicaemia				10 2.7%
6. Acute renal failure	10 2.0%			
Lymphoid leukaemia		8 3.0%		
Congenital malformations of great arteries			7 2.8%	
Congenital malformations of pulmonary and tricuspid valves				10 2.7%
7. Injury to gastrointestinal tract	10 2.0%			
Congenital malformations of great arteries		7 2.6%		
Diffuse non-Hodgkin's lymphoma			7 2.8%	
Lymphoid leukaemia				8 2.1%
8. Lymphoid leukemia	9 1.8%		6 2.4%	
Cardiomyopathy		6 2.2%		
Hepatic failure, other				8 2.1%
9. Other congenital anomalies of heart	9 1.8%	N/A[a]	N/A[a]	N/A[a]
10. Malignant neoplasm of ovary and other uterine adnexa	8 1.6%	N/A[a]	N/A[a]	N/A[a]

[a] Diagnoses with <6 people have been suppressed due to ICES privacy policies.

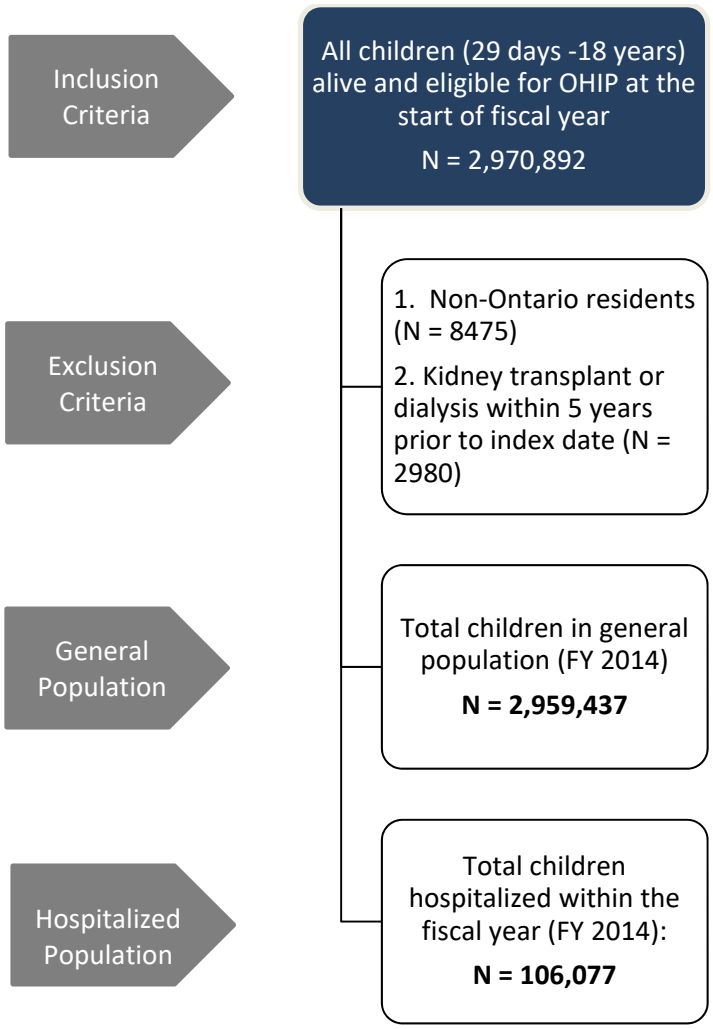
Note: As the 10 most prevalent diagnoses for children hospitalized with AKI changed across the study years, we have represented this using dotted lines. For example, in 1996-2001, the most prevalent diagnosis was acute appendicitis, but for the remaining study years it was congenital malformations of cardiac septa. As such, some diagnoses appear multiple times in the table based on the prevalence for that time period. For example, acute renal failure was the second most prevalent diagnosis in 2006-2009 but was the third most prevalent in 2010-2014.

Supplemental Table 5: Risk of 30-day mortality among hospitalized children after dialysis-receiving AKI stratified by dialysis modality

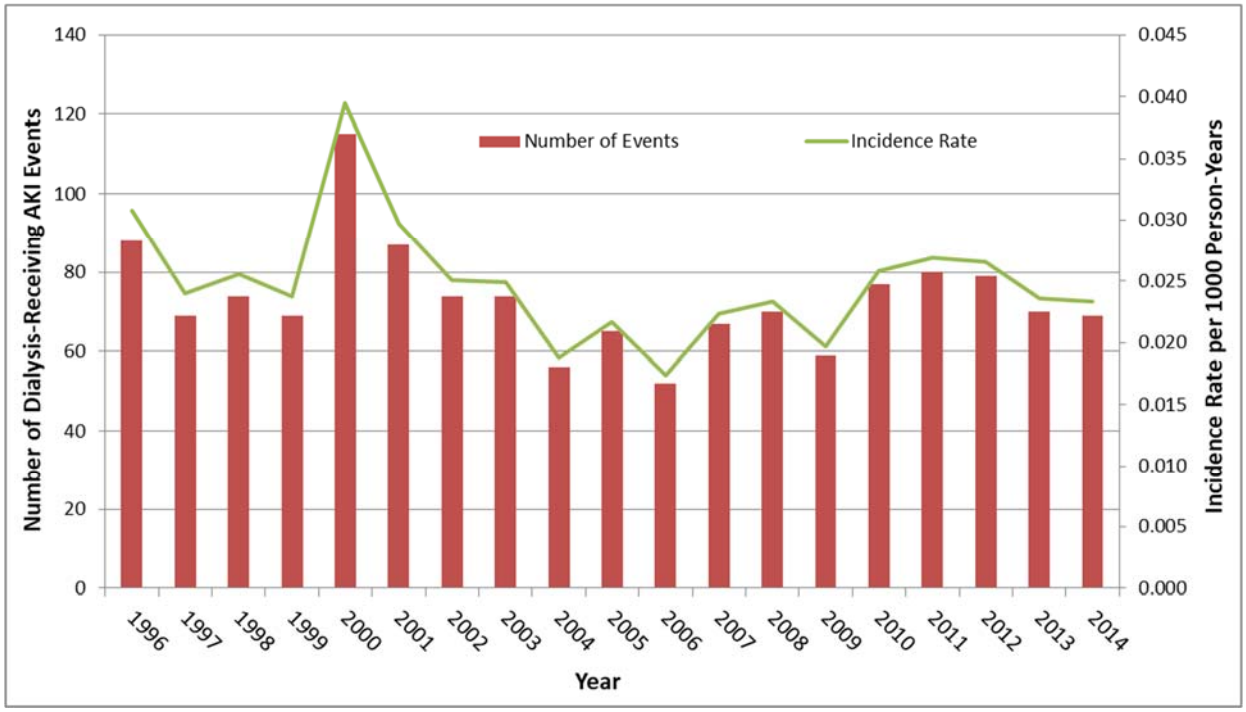
				Total
	PD	HD	CKRT	Total
Children (n=1394)	55/655 (8%)	64/346 (19%)	146/393 (37%)	265/1394 (19%)

CKRT: Chronic Kidney Replacement Therapy
HD: Hemodialysis
PD: Peritoneal Dialysis

Supplemental Figure 1: Cohort creation for children to assess incidence of dialysis-receiving acute kidney injury for the fiscal year April 1, 2014 to March 31, 2015

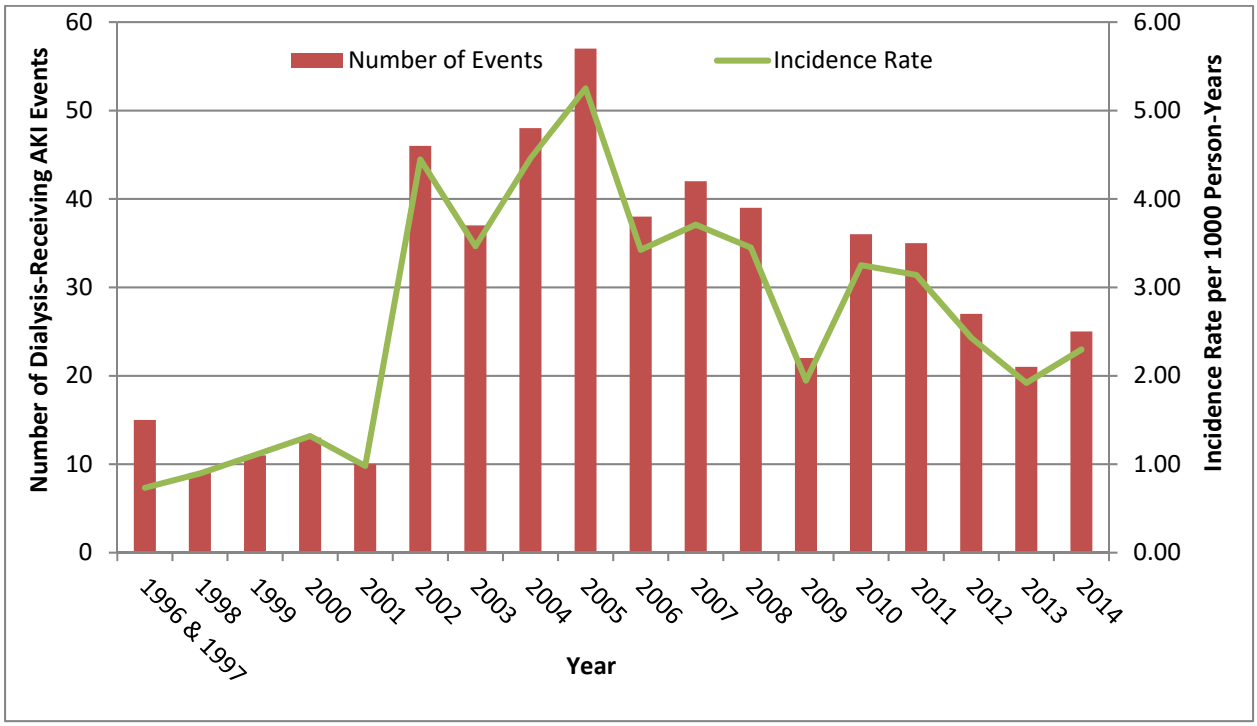


Supplemental Figure 2: Incidence of dialysis-receiving acute kidney injury among total pediatric population between April 1, 1996 and March 31, 2015 in Ontario



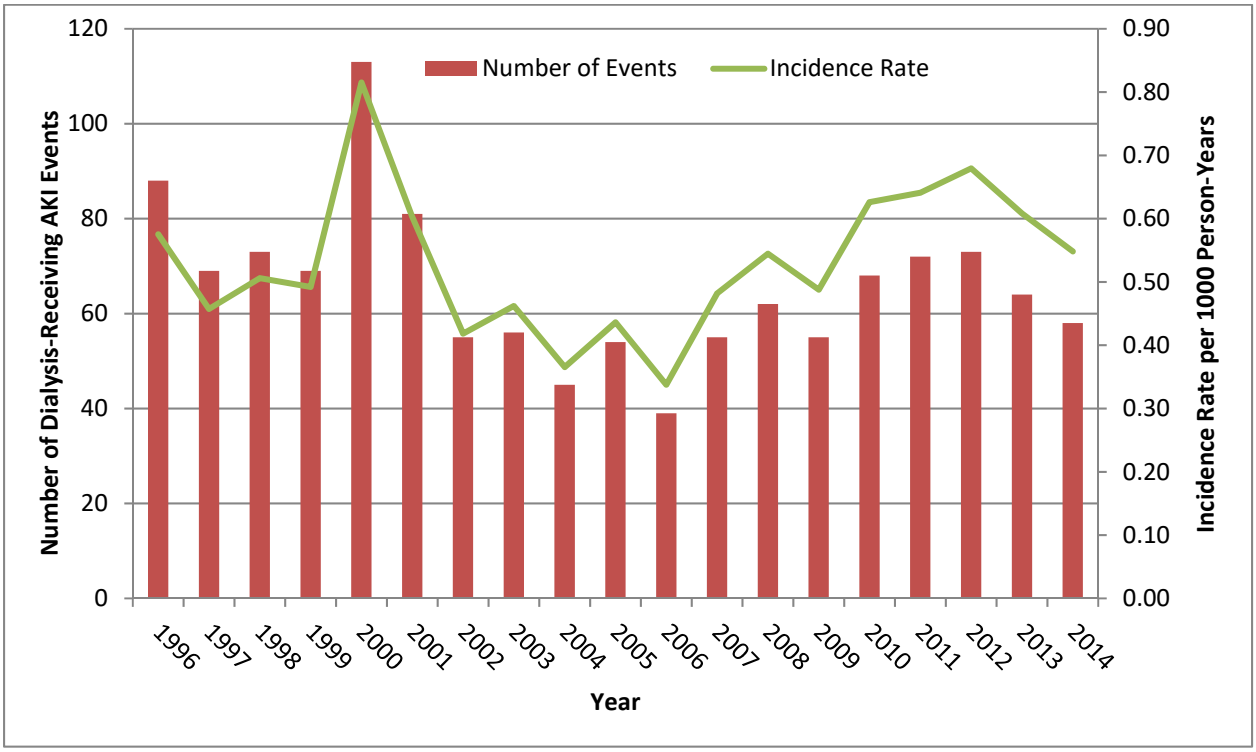
Abbreviations: AKI, acute kidney injury.

Supplemental Figure 3: Incidence of dialysis-receiving acute kidney injury (defined using acute dialysis or access codes) among hospitalized neonates between April 1, 1996 and March 31, 2015 in Ontario



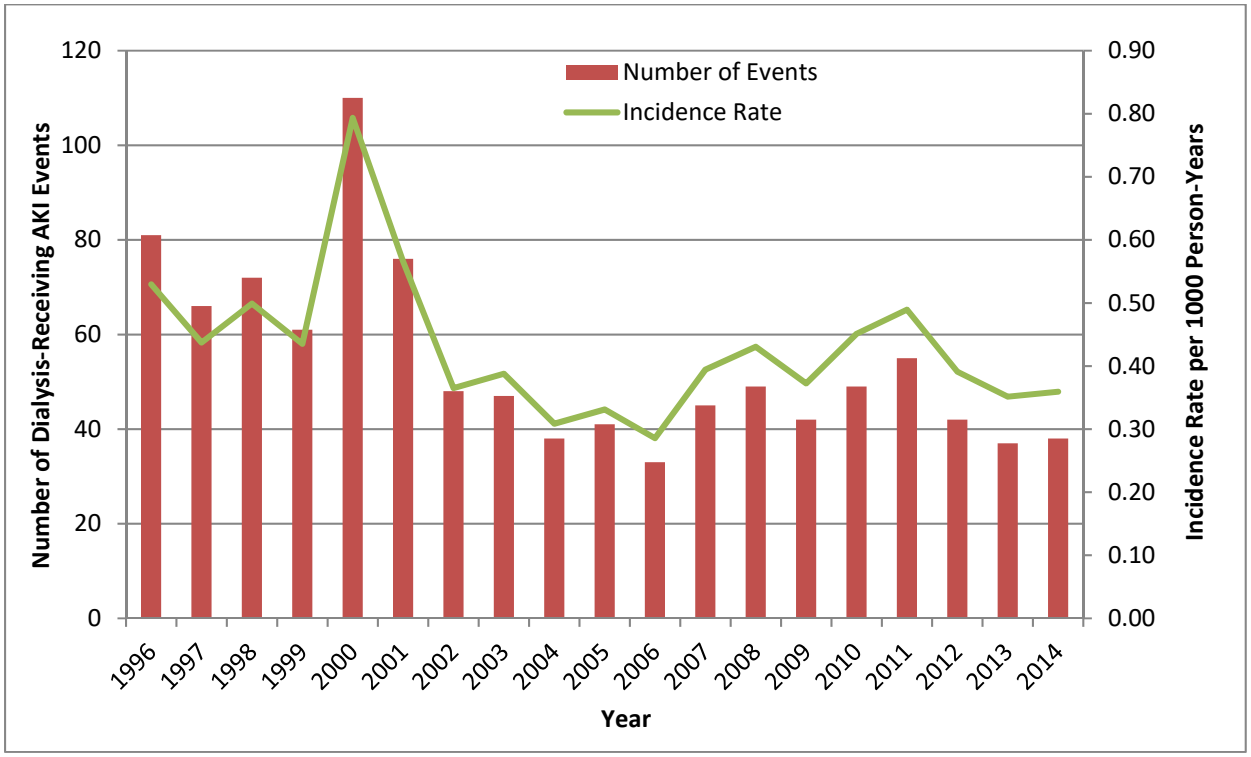
Abbreviations: AKI, acute kidney injury.

Supplemental Figure 4: Incidence of dialysis-receiving AKI (defined using only acute dialysis codes) among hospitalized children (n=1249) between April 1, 1996 and March 31, 2015 in Ontario



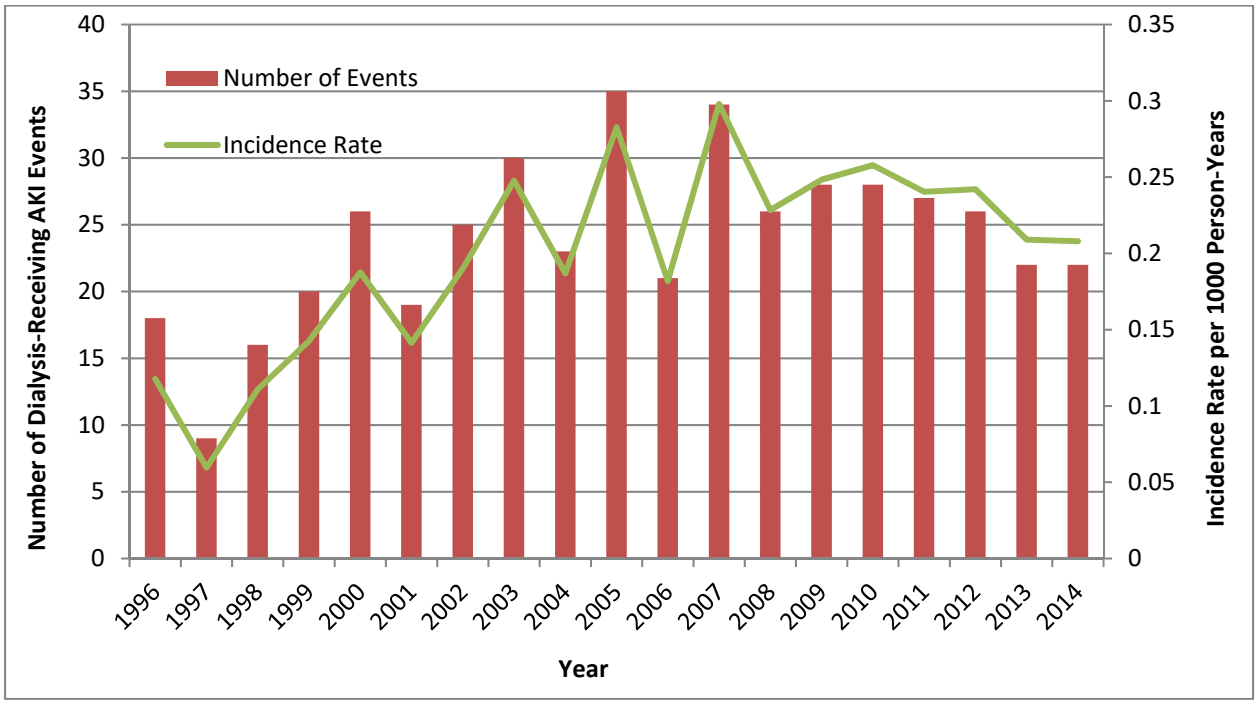
Abbreviations: AKI, acute kidney injury.

Supplemental Figure 5: Incidence of dialysis-receiving AKI (defined using acute dialysis or access codes) among hospitalized children not receiving cardiac surgery (n=1030) between April 1, 1996 and March 31, 2015 in Ontario



Abbreviations: AKI, acute kidney injury.

Supplemental Figure 6: Incidence of dialysis-receiving AKI (defined using AKI diagnosis combined with acute dialysis codes) among hospitalized children (n=455) between April 1, 1996 and March 31, 2015 in Ontario



Abbreviations: AKI, acute kidney injury.