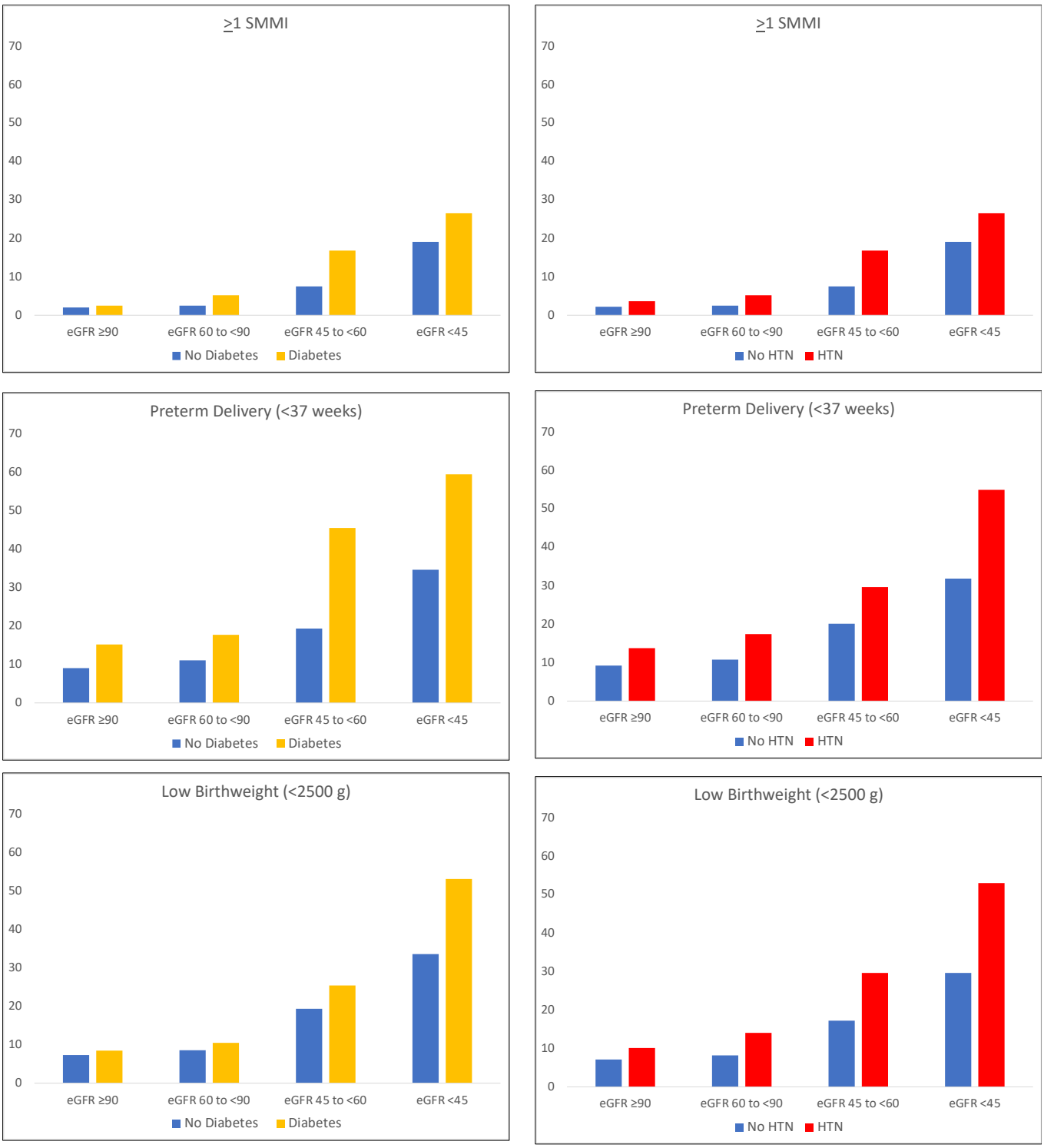
Supplemental Table of Contents:

Supplementary Figure 1. Primary outcomes by serum creatinine availability in the cohort

Percentage of each primary outcome (≥1 Severe Maternal Morbidity Indicator (SMMI), preterm delivery (<37 weeks gestational age) and low birthweight offspring (<2500 grams) stratified by serum creatinine availability in the cohort. Blue bars represent entire cohort (N=565,907 maternal observations, N=576,814 offspring observations). Orange bars represent cohort with a serum creatinine measured within 365 days of index date (N=419,366 maternal observations, N=427,414 offspring observations). Green bars represent cohort with 2 or more serum creatinine measurements within 2 years of index date (N=108,179 maternal observations, N=110,442 offspring observations).

Supplementary Figure 2. Primary outcomes by pre-gestational diabetes and hypertension.



Percentage of each primary outcome (≥1 Severe Maternal Morbidity Indicator (SMMI), preterm delivery (<37 weeks gestational age) and low birthweight offspring (<2500 grams) stratified by preconception diabetes diagnoses (top row) and hypertension diagnoses (bottom row). TOP ROW: Blue bars represent cohort with no diabetes diagnoses (N=527,671 maternal observations, N=537,801 offspring observations). Yellow bars represent cohort with diabetes diagnosis (N=38,236 maternal observations, N=39,013 offspring observations). BOTTOM ROW: Blue bars represent cohort with no hypertension diagnoses (N=524,893 maternal observations, N=534,940 offspring observations). Red bars represent cohort with hypertension diagnosis (N=41,014 maternal observations, N=41,874 offspring observations).

Supplementary Table 1. Checklist of recommendations for reporting of observational studies using the REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) Statement

	Item No	STROBE items	RECORD items	Reported
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract. (b) Provide in the abstract an informative and balanced summary of what was done and what was found.	(1.1) The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included. (1.2) If applicable, the geographic region and time frame within which the study took place should be reported in the title or abstract. (1.3) If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract.	Abstract
INTRODUCTION				
Background/ rationale	2	Explain the scientific background and rationale for the investigation being reported.		Introduction
Objectives	3	State specific objectives, including any prespecified hypotheses.		Introduction
METHODS				
Study design	4	Present key elements of study design early in the paper.		Methods: Study Design
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection.		Methods: Study Design
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of	(6.1) The methods of study population selection (such as codes or algorithms used to identify subjects) should be listed in detail. If this is not possible, an explanation should be provided.	Methods: Population

		participants. Describe methods of follow-up. (b) For matched studies, give matching criteria and number of exposed and unexposed.	(6.2) Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided. (6.3) If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process, including the number of individuals with linked data at each stage.	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.	(7.1) A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided.	Methods: Study Exposures, Maternal Outcomes, and Fetal Outcomes
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group.		Methods: Data Sources Supplemental Tables 2-3
Bias	9	Describe any efforts to address potential sources of bias.		Methods: Statistical analyses
Study size	10	Explain how the study size was arrived at.		Methods: Population Figure 1
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why.		Methods: Statistical Analyses
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding. (b) Describe any methods used to examine subgroups and interactions.		Methods: Statistical Analyses

		(c) Explain how missing data were addressed. (d) If applicable, explain how loss to follow-up was addressed. (e) Describe any sensitivity analyses.		
Data access and cleaning methods		N/A	(12.1) Authors should describe the extent to which the investigators had access to the database population used to create the study population. (12.2) Authors should provide information on the data cleaning methods used in the study.	Methods: Data Sources Data Access/Access to Data Analysis Protocol
Linkage		N/A	(12.3) State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided.	Methods: Data Sources
RESULTS				
Participants	13	(a) Report numbers of individuals at each stage of study--e.g. numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed. (b) Give reasons for non-participation at each stage. (c) Consider use of a flow diagram.	(13.1) Describe in detail the selection of the persons included in the study (i.e., study population selection), including filtering based on data quality, data availability, and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.	Results: Baseline Characteristics Figure 1
Descriptive data	14	(a) Give characteristics of study participants (e.g. demographic, clinical, social) and information on exposures and potential confounders. (b) Indicate number of participants with missing data for each variable of interest.		Results: Baseline Characteristics Table 1

		(c) Summarize follow-up time (e.g. average and total amount).		
Outcome data	15	Report numbers of outcome events or summary measures over time.		Results: Maternal Outcomes and Fetal Outcomes
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g. 95% confidence interval). Make clear which confounders were adjusted for and why they were included. (b) Report category boundaries when continuous variables were categorized. (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period.		Results: Maternal Outcomes and Fetal Outcomes
Other analyses	17	Report other analyses done (e.g. analyses of subgroups and interactions, and sensitivity analyses).		Results: Maternal Outcomes, Fetal Outcomes, Proteinuria Outcomes by eGFR and Proteinuria Severity Figures 2-5 Supplemental Tables 5-7
Key results	18	Summarize key results with reference to study objectives.		Discussion
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias.	(19.1) Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over time, as they pertain to the study being reported.	Discussion

Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence.		Discussion
Generalizability	21	Discuss the generalizability (external validity) of the study results.		Discussion
OTHER INFORMATION				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based.		Funding
Accessibility of protocol, raw data, and programming code		N/A	(22.1) Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code.	Data access/access to data analysis protocol

Supplementary Table 2: Codes used in the study to identify baseline characteristics

Source	Variable	Codes
Age		
RPDB	BDATE	
Income Quintile		
RPDB	INCQUINT	%getdemo ICES macro
Rural Residence		
RPDB	RURAL	%getdemo ICES macro
Nulliparous		
MOMBABY	B_MULTIBIRTH	"T"
	M_MULTIBIRTH	"T"
Multiple Gestation		
MOMBABY	M_IKN	
	B_DATE	
Diabetes		
CIHI-DAD	ICD-9	"250"
	ICD-10	"E10", "E11", "E13", 'E14"
OHIP	Diagnostic code	"250"
	Fee code	"K045", "K046", "K029", "K030", "Q040"
Myocardial Infarction		
CIHI-DAD	ICD-9	"410"
	ICD-10	"I21", "I22"
Hypertension		
CIHI-DAD	ICD-9	"401", "402", "403", "404", "405"
	ICD-10	"I10", "I11", "i12", "I13", "I15"
OHIP	Diagnostic code	"401", "402", "403"
Family Physician Visit		
IPDB	Main Specialty	"GP/FP"
OHIP	SERVDATE	
Nephrologist Visit		
IPDB	Main Specialty	"NEPHROLOGY"
OHIP	Fee code	"A160", "A161", "A163", "A164", "A165", "A166", "A168", "A865", "C160", "C161", "C162", "C163", "C164", "C165", "C166", "C167", "C169", "C865", "W165", "W160", "W865", "W166", "W862", "W864", "W867", "W869 ", "W164", "W162", "W161", "W163", "W168", "A130", "A131", "A133", "A134", "A135", "A136", "A138", "A435", "C121", "C122", "C123", "C124", "C130",

		"C131", "C132", "C133", "C134", "C135", "C136", "C137", "C138", "C139", "C142", "C143", "C168", "C435", "C982", "W121", "W130", "W131", "W132", "W133", "W134", "W138", "W232", "W234", "W235", "W236", "W237", "W239", "W435", "W972", "W982"

Supplementary Table 3: Codes used to identify Severe Maternal Morbidity (SMM) Indicators

SMM Indicator	Source	Codes
Severe preeclampsia and HELP syndrome	CIHI-DAD/SDS	ICD-10: “O141”, “0142”
Eclampsia	CIHI-DAD/SDS	ICD-10: “O15”
Cerebral venous thrombosis in pregnancy or in the puerperium	CIHI-DAD/SDS	ICD-10: “O225”, “O873”
Acute fatty liver with transfusion	CIHI-DAD/SDS	ICD -10: “O266” + [BTREDBC]= “1” OR ICD-10: “O266: + [BTPLASMA]= “1”
Pulmonary, cardiac, and CNS complications of anesthesia during pregnancy, the puerperium, or labor and delivery	CIHI-DAD/SDS	ICD-10: "O290", "O291", "O292", "O890", "O891", "O892", "O740", "O741", "O742", "O743"
Placenta previa with hemorrhage	CIHI-DAD/SDS	ICD-10: "O441" + [BTREDBC]="1"
Placental abruption with coagulation defect	CIHI-DAD/SDS	ICD-10: "O450"
Antepartum hemorrhage with coagulation defect	CIHI-DAD/SDS	ICD-10: "O460"
Intrapartum Hemorrhage with coagulation defect	CIHI-DAD/SDS	ICD-10: "O670"
Intrapartum Hemorrhage with RBC transfusion	CIHI-DAD/SDS	ICD-10: "O67" + [BTREDBC]="1"
Rupture of the uterus with RBC transfusion, procedures to the uterus or hysterectomy (uterine rupture with RBC)	CIHI-DAD/SDS	ICD10: "O710", "O711" + any of the following: • [BTREDBC]="1" • CCI: "1RM13", "1KT51", "5PC91LA", "5PC91HV" + [BTREDBC]="1" • CCI: "5MD60RC", "5MD60RD", "5MD60KE", "5MD60CB", "1RM89LA" • CCI: "1RM87LAGX"

		Note: CCI code "1RM89LA" is only included if codes "1PL74", ""1RS74", or "1RS80" are NOT also present
Postpartum hemorrhage with RBC transfusion, procedures to the uterus or hysterectomy	CIHI-DAD/SDS	ICD-10: "O72" + any of the following: • [BTREDBC]="1" • CCI: "1RM13", "1KT51", "5PC91LA", "5PC91HV" + CIHI- 1" • CCI: "5MD60RC", "5MD60RD", "5MD60KE", "5MD60CB", "1RM89LA" • CCI: "1RM87LAGX" Note: CCI code "1RM89LA" is only included if codes "1PL74", ""1RS74", or "1RS80" are NOT also present
Cardiac conditions	CIHI-DAD/SDS	ICD-10: "O742", "O891", "O903", "I21", "I22", "I42", "I43", "I46", "I490", "I50", "J81" CCI: "1HZ09", "1HZ30"
Obstetric Shock	CIHI-DAD/SDS	ICD-10: "O751", "R57", "T805", "T886"
Septicemia during labour	CIHI-DAD/SDS	ICD-10:"O753"
Complication of obstetric surgery/ procedure	CIHI-DAD/SDS	ICD-10: "O754"
Puerperal sepsis	CIHI-DAD/SDS	ICD-10: "085"
Obstetric embolism	CIHI-DAD/SDS	ICD- 10: “O88”
Acute renal failure	CIHI-DAD/SDS	ICD-10: "O904", "N17", "N19", N990"
Disseminated intravascular coagulation	CIHI-DAD/SDS	ICD-10: "D65"
Sickle cell anemia with crisis	CIHI-DAD/SDS	ICD-10: "D570"
Acute psychosis	CIHI-DAD/SDS	ICD-10: "F531" ,"F23"
Status epilepticus	CIHI-DAD/SDS	ICD-10: "G41"
Cerebral edema or coma	CIHI-DAD/SDS	ICD-10: "G936", "R402"

Cerebrovascular diseases: subarachnoid and intracranial hemorrhage, cerebral infarction, stroke	CIHI-DAD/SDS	ICD-10: "I60", "I61", "I62", "I63","I64"
Status asthmaticus:	CIHI-DAD/SDS	ICD-10: "J4501", "J4511", "J4581", "J4591"
Adult respiratory distress syndrome	CIHI-DAD/SDS	ICD-10:"J80"
Acute abdomen	CIHI-DAD/SDS	ICD-10: "K35", "K37", "K65", "N733", "N73"
Hepatic failure	CIHI-DAD/SDS	ICD-10: "K71", "K72"
Assisted ventilation through endotracheal tube (invasive ventilation)	CIHI-DAD/SDS	CCI: "1GZ31CAND"
Assisted ventilation through tracheostomy	CIHI-DAD/SDS	CCI: "1GZ31CRND"
Hysterectomy	CIHI-DAD/SDS	CCI: "5MD60RC", "5MD60RD", "5MD60KE", "5MD60CB", "1RM87LAGX", "1RM89LA" Note: for CCI: "1RM89LA", exclude if CCI: "1PL74", "1RS74", "1RS80" also present
Dialysis	CIHI-DAD/SDS	CCI: "1PZ21"
Evacuation of incisional hematoma with transfusion	CIHI-DAD/SDS	CCI: "5PC73JS" + [BTREDBC]= "1"
Repair of bladder, urethra, or intestine	CIHI-DAD/SDS	CCI: "5PC80JR", "1NK80", "1NM80"
Procedures to the uterus/pelvic vessels with RBC transfusion	CIHI-DAD/SDS	CCI: "1RM13", "1KT51", "5PC91LA", "5PC91HV" + [BTREDBC] = "1"
Surgical or manual correction of inverted uterus for vaginal births only:	CIHI-DAD/SDS	CCI: "5PC91HQ", "5PC91HP" Note: above codes restricted to vaginal births (i.e., absence of caesarean CCI: "5MD60")
Maternal ICU admission	CIHI-DAD/SDS	[SCU]: "10", "20", "25", "30", "35", "40","45","60","80"
Reclosure of caesarean wound	CIHI-DAD/SDS	CCI: "5PC80JM", "5PC80JH" + [BTREDBC] = "1"

Curettage with RBC transfusion	CIHI-DAD/SDS	CCI: "5PC91GA", "5PC91GC", "5PC91GD" + [BTREDBC] = "1"
Additional Mortality Indicators		
Death, obstetric, cause unspecified	CIHI-DAD/SDS	ICD-10: "O95"
Death, obstetric, after 42 days but 1 year after delivery	CIHI-DAD/SDS	ICD-10: "O96"
Death from sequelae of direct obstetric causes	CIHI-DAD/SDS	ICD-10: "O97"
Sudden death, death from unspecified cause	CIHI-DAD/SDS	ICD-10: "R96", "R97", "R98", "R99"

Supplementary Table 4: Codes used in the study to identify outcome conditions

Source	Variable	Codes
Pre-term Delivery		
MOMBABY	B_GESTWKS_DEL	
	M_GESTWKS_DEL	
Low Birthweight		
CIHI-DAD	WEIGHT	
Maternal Death		
RPDB	DTHDATE	
Admission to ICU		
CIHI-DAD	CCI	"1GZ31CAND", "1GZCRND", "1GZ31GPND"
	SCU	"10", "20", "25", "30", "40", "45", "60", "80", "90", "95"
OHIP	Fee code	"G557", "G558", "G559", "G400", "G401", "G402", "G405", "G406", "G407"
Gestational Hypertension		
CIHI-DAD	ICD-10	"O13", "O16"
Pre-eclampsia		
CIHI-DAD	ICD-10	"O11", "O14", "O15"
OHIP	Diagnostic code	"642"
Post-partum Hemorrhage		
CIHI-DAD	ICD-10	"O72"
Acute Renal Failure (SMM indicator)		
CIHI-DAD/SDS	ICD-10	"O904", "N17", "N19", N990"
Dialysis (SMM indicator)		
CIHI-DAD/SDS	ICD-10	CCI: "1PZ21"
NICU Admission		
CIHI-DAD	CCI	"1GZ31CAND", "1GZCRND", "1GZ31GPND"
	SCU	"50"
OHIP	Fee code	"G557", "G558", "G559", "G400", "G401", "G402", "G405", "G406", "G407"
Stillbirth		
MOMBABY	B_STILLBIRTH	“T”
	M_STILLBIRTH	“T”
Neonatal Death		
RPDB	DTHDATE	

Supplementary Table 5: Adjusted Modification of the effect of eGFR categories on the odds of at least one Severe Maternal Morbidity indicator by proteinuria categories

eGFR (ml/min/1.73m^2)	Proteinuria category	Expected Effect[1] (Odds Ratio)	Multiplicative Interaction[2]		Additive Interaction[2]	
			Multiplicative Interaction[1] (Odds Ratio)	p-value[4]	Relative excess risk due to interaction[1,3] (Odds Ratio)	95% CI[4]
60 to < 90	Moderate	1.63	1.30	0.008	0.39	0.11 to 0.67
45 to <60	Moderate	2.32	0.70	0.512	-0.73	-3.41 to 1.95
< 45	Moderate	8.21	5.08	0.128	6.65	-1.12 to 14.36
60 to < 90	Severe	1.70	0.96	0.847	-0.01	-0.70 to 0.68
45 to <60	Severe	13.61	2.92	0.011	10.10	2.20 to 18.00
< 45	Severe	19.42	8.54	0.035	17.39	5.12 to 29.67

[1]We reported the resulting estimates assuming an independent working correlation. We also estimated the correlation to be 0.04 using an exchangeable working correlation. Models were adjusted for age, baseline diabetes, baseline hypertension, nulliparous status, and multiple gestation.

[2] Interpretation of Interaction Measures. *Multiplicative Interaction:* If the expected joint effect of the exposure is equivalent to their observed effect, they act multiplicatively; If the observed joint effect is > than then expected effect, then it is a super-multiplicative interaction; If the observed joint effect is < than then expected effect, then it is a sub-multiplicative interaction. *Relative excess risk due to interaction (RERI)*: RERI=0 indicates no interaction; RERI> 0 indicates super-additive interaction; RERI < 0 indicates sub- additive interaction. Preserved kidney function (eGFR ≥90 ml/min/1.73 m^2) and normal/mild proteinuria (ACR value < 3 mg/mmol or PCR value < 15 mg/mmol or urine dipstick normal) served as the referent categories.

[3] z-scores for the RERI p-values were calculated by dividing the RERI by the robust standard error obtained from a GEE model.

[4] p-values and 95% CI widths were not adjusted for multiple testing. Robust standard errors from a GEE model were used for inferences to adjust for the correlation of pregnancies within the same mother.

Supplementary Table 6: Adjusted Modification of the effect of eGFR categories on the odds of pre-term birth by proteinuria categories

eGFR (ml/min/1.73m^2)	Proteinuria category	Expected Effect[1] (Odds Ratio)	Multiplicative Interaction[2]		Additive Interaction[2]	
			Multiplicative Interaction[1] (Odds Ratio)	p-value[4]	Relative excess risk due to interaction[1,3] (Odds Ratio)	95% CI[4]
60 to < 90	Moderate	1.43	1.10	0.108	0.15	-0.01 to 0.30
45 to <60	Moderate	3.14	1.48	0.241	1.14	-0.65 to 2.92
< 45	Moderate	5.55	1.55	0.486	2.27	-2.81 to 7.35
60 to < 90	Severe	2.25	1.40	0.004	0.70	0.21 to 1.18
45 to <60	Severe	7.41	2.81	0.002	5.13	1.44 to 8.82
< 45	Severe	6.97	1.57	0.459	3.41	-2.03 to 8.86

[1]We reported the resulting estimates assuming an independent working correlation. We also estimated the correlation to be 0.32 using an exchangeable working correlation. Models were adjusted for age, baseline diabetes, baseline hypertension, nulliparous status, and multiple gestation.

[2] Interpretation of Interaction Measures. *Multiplicative Interaction:* If the expected joint effect of the exposure is equivalent to their observed effect, they act multiplicatively; If the observed joint effect is > than then expected effect, then it is a super-multiplicative interaction; If the observed joint effect is < than then expected effect, then it is a sub-multiplicative interaction. *Relative excess risk due to interaction (RERI)*: RERI=0 indicates no interaction; RERI> 0 indicates super-additive interaction; RERI < 0 indicates sub- additive interaction. Preserved kidney function (eGFR ≥90 ml/min/1.73 m^2) and normal/mild proteinuria (ACR value < 3 mg/mmol or PCR value < 15 mg/mmol or urine dipstick normal) served as the referent categories.

[3] z-scores for the RERI p-values were calculated by dividing the RERI by the robust standard error obtained from a GEE model.

[4] p-values and 95% CIs were not adjusted for multiple testing. Robust standard errors from a GEE model were used for inferences to adjust for the correlation of pregnancies within the same mother.

.

Supplementary Table 7: Adjusted Modification of the effect of eGFR categories on the odds of low birthweight by proteinuria categories

eGFR (ml/min/1.73m^2)	Proteinuria category	Expected Effect[1] (Odds Ratio)	Multiplicative Interaction[2]		Additive Interaction[2]	
			Multiplicative Interaction[1] (Odds Ratio)	p-value[4]	Relative excess risk due to interaction[1,3] (Odds Ratio)	95% CI [4]
60 to < 90	Moderate	1.40	1.12	0.092	0.17	-0.01 to 0.35
45 to <60	Moderate	3.26	1.92	0.111	1.63	-0.57 to 3.83
< 45	Moderate	6.20	1.16	0.815	1.35	-5.01 to 7.71
60 to < 90	Severe	2.19	1.35	0.029	0.61	0.06 to 1.16
45 to <60	Severe	12.57	5.68	< 0.0001	10.59	4.44 to 16.74
< 45	Severe	10.78	1.54	0.471	5.58	-2.63 to 13.79

[1]We reported the resulting estimates assuming an independent working correlation. We also estimated the correlation to be 0.29 using an exchangeable working correlation. Models were adjusted for age, baseline diabetes, baseline hypertension, nulliparous status, and multiple gestation.

[2] Interpretation of Interaction Measures. *Multiplicative Interaction:* If the expected joint effect of the exposure is equivalent to their observed effect, they act multiplicatively; If the observed joint effect is > than then expected effect, then it is a super-multiplicative interaction; If the observed joint effect is < than then expected effect, then it is a sub-multiplicative interaction. *Relative excess risk due to interaction (RERI)*: RERI=0 indicates no interaction; RERI> 0 indicates super-additive interaction; RERI < 0 indicates sub- additive interaction. Preserved kidney function (eGFR ≥90 ml/min/1.73 m^2) and normal/mild proteinuria (ACR value < 3 mg/mmol or PCR value < 15 mg/mmol or urine dipstick normal) served as the referent categories.

[3] z-scores for the RERI p-values were calculated by dividing the RERI by the robust standard error obtained from a GEE model.

[4] p-values and 95% CIs were not adjusted for multiple testing. Robust standard errors from a GEE model were used for inferences to adjust for the correlation of pregnancies within the same mother.