

Supplemental Online Content

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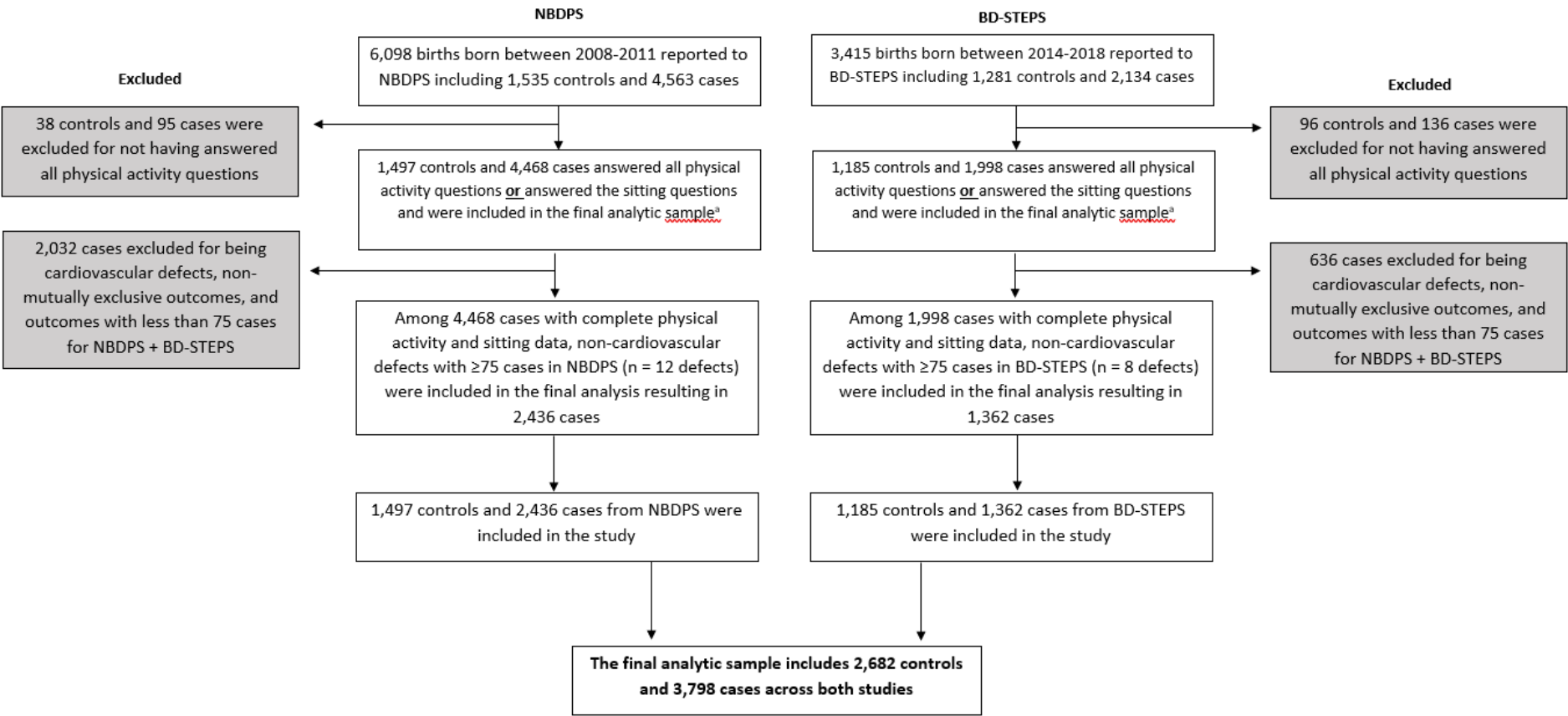
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eFigure 1: Data inclusion for analyses of pre-pregnancy physical activity and sitting with birth defects; NBDPS (2008-2011) and BD-STEPS (2014-2018)

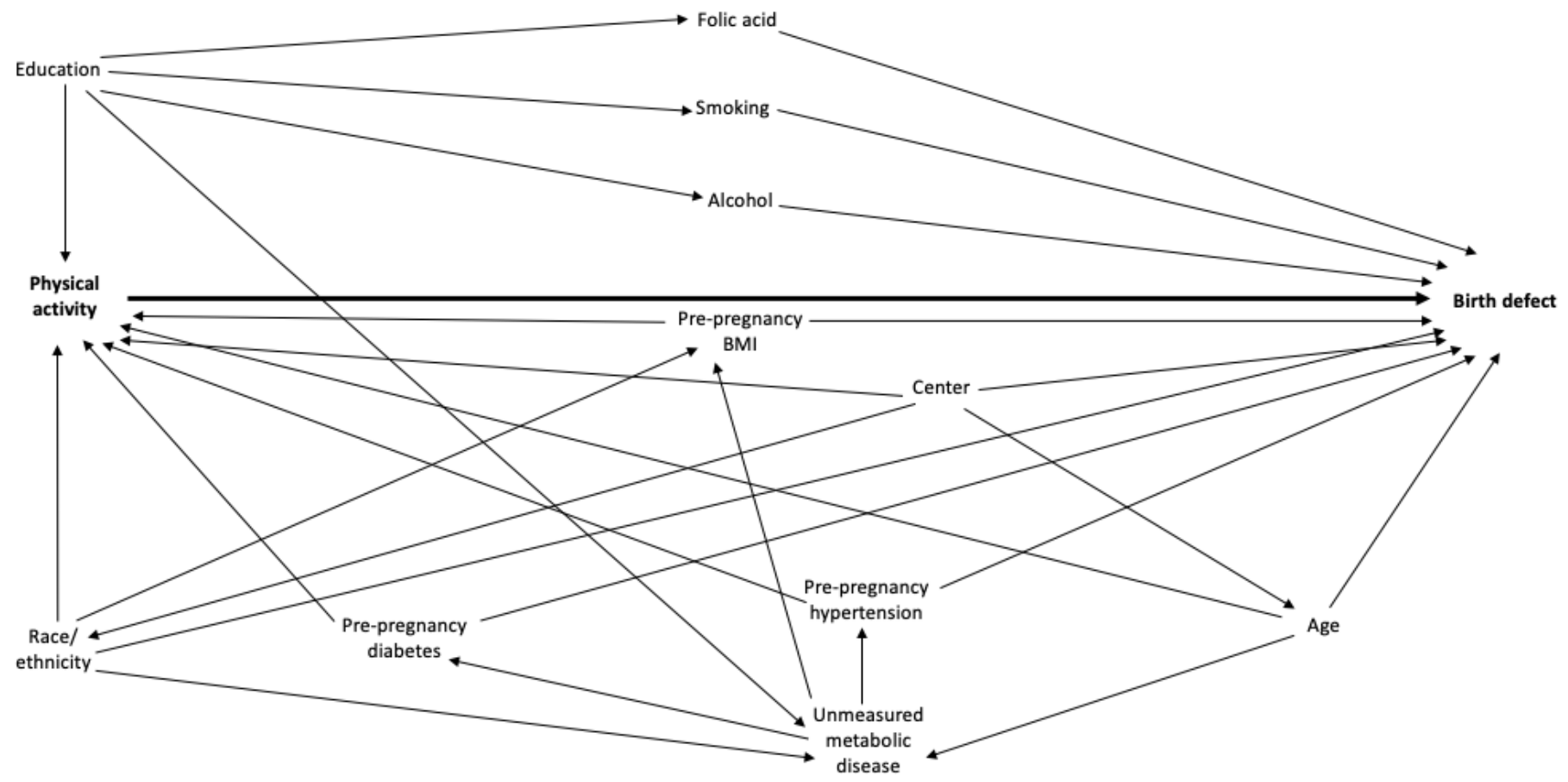


Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; NBDPS, National Birth Defects Prevention Study

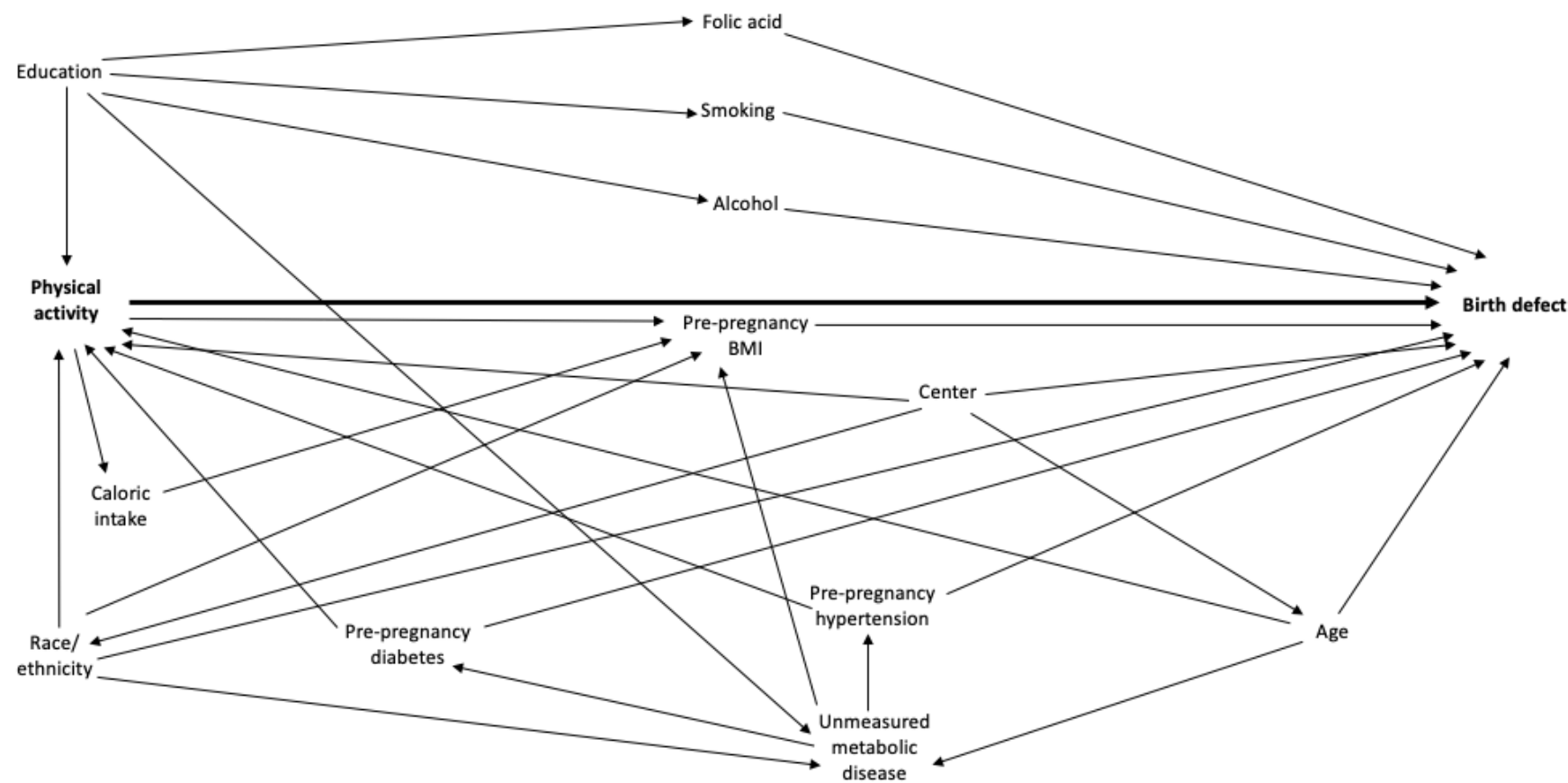
^aThe distribution of physical activity variables was determined among controls to develop the exposure categories based on tertiles.

eFigure 2. Directed Acyclic Graph for the association between physical activity and birth defects with body mass index (BMI) as a confounder or a mediator

a: BMI as a confounder



b: BMI as a mediator



eTable 1: Physical activity and sitting questionnaire* used by NBDPS (2008-2011) and BD-STEPS (2014-2018)

#	Question	Response Options
	I am going to ask you about the time you spent being physically active in the three months before you became pregnant. Please answer each question even if you do not consider yourself to be an active person. Think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise, or sport.	
1	Now think about all the vigorous activities which take hard physical effort that you did in the three months before you became pregnant. Vigorous activities make you breathe much harder than normal and may include heavy lifting, digging, aerobics, running, or fast bicycling. Think only about those physical activities you did for at least 10 minutes at a time. During the three months before you became pregnant, in a typical week on how many days did you do <u>vigorous physical activities</u> ? <i>Probe: Think only about those physical activities that you do for at least 10 minutes at a time.</i>	0-7 days/week, don't know, refused; if zero, don't know, or refused then skip to question #3
2	How much time did you usually spend doing vigorous physical activities on one of those days? <i>Probe: Think only about those physical activities that you do for at least 10 minutes at a time.</i>	Can answer in hours/day, minutes/day, hours/week, or minutes/week; If don't know or refused then ask the question, "In the three months before you became pregnant, how much time in total would you spend in a typical week doing vigorous physical activities?"
3	Now think about activities which take moderate physical effort that you did in the three months before you became pregnant. Moderate physical activities make you breathe somewhat harder than normal and may include child care while standing, carrying light loads at home or work, scrubbing or mopping floors, or bicycling at a regular pace. Do not include walking. Again, think only about those physical activities that you did for at least 10 minutes at a time. During the three months before you became pregnant, in a typical week on how many days did you do moderate physical activities? <i>Probe: Think only about those physical activities that you do for at least 10 minutes at a time. Child care includes dressing, bathing, grooming, feeding, or occasional lifting.</i>	0-7 days/week, don't know, refused; if zero, don't know, or refused then skip to question #5
4	How much time did you usually spend doing moderate physical activities on one of those days? <i>Probe: Think only about those physical activities that you do for at least 10 minutes at a time.</i>	Can answer hours/day, minutes/day, hours/week, or minutes/week; If don't know or refused then ask the question, "In the three months before you became pregnant, what is the total amount of time you spent in a typical week doing moderate physical activities?"
5	Now think about the time you spent walking in the three months before you became pregnant. This includes at work and at home,	0-7 days/week, don't know, refused;

	walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure. During the three months before you became pregnant, in a typical week on how many days did you <u>walk</u> for at least 10 minutes at a time? <i>Probe: Think only about the walking that you do for at least 10 minutes at a time.</i>	if zero, don't know, or refused then skip to question #7
6	How much time did you usually spend walking on one of those days?	Can answer hours/day, minutes/day, hours/week, or minutes/week; If don't know or refused then ask the question, "In the three months before you became pregnant, what is the total amount of time you spent walking in a typical week?"
7	Now think about the time you spent sitting on week days in the three months before you became pregnant. Include time spent at work, at home, while doing course work, and during leisure time. This may include time sitting at a desk, visiting friends, reading or sitting or lying down to watch television. In the three months before you became pregnant, in a typical week how much time did you usually spend sitting on a weekday? <i>Probe: Include time spent lying down (awake) as well as sitting.</i>	Can answer hours/day or minutes/day; If don't know or refused then ask the question, "What is the total amount of time you spent <i>sitting</i> on a typical Wednesday?"

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; NBDPS, National Birth Defects Prevention Study

*The questionnaire was modified from the International Physical Activity Questionnaire.²⁰

eTable 2: Characteristics of cases and controls; NBDPS (2008-2011) and BD -STEPS (2014-2018)

Maternal Characteristics	Cases (n=3798)		Controls (n=2682)	
	N	(%)	N	(%)
<u>Center</u>				
Arkansas	484	12.7	323	12.0
California	491	12.9	207	7.7
Iowa	402	10.6	352	13.1
Massachusetts	564	14.8	347	12.9
New York	410	10.8	407	15.2
Texas	155	4.1	135	5.0
Georgia	386	10.2	363	13.5
North Carolina	530	14.0	332	12.4
Utah	376	9.9	216	8.1
<u>Maternal age at delivery</u>				
≤19 years	323	8.5	153	5.7
20-24 years	872	23.0	460	17.2
25-29 years	1021	26.9	763	28.4
30-34 years	991	26.1	823	30.7
35-39 years	486	12.8	399	14.9
≥40 years	105	2.8	84	3.1
<u>Maternal race/ethnicity</u>				
Non-Hispanic White	2164	57.0	1494	55.7
Non-Hispanic Black	325	8.6	307	11.4
Hispanic	1001	26.4	666	24.8
Other	307	8.1	213	7.9
Missing	1	0.0	2	0.1
<u>Maternal education</u>				
0-11 years	528	13.9	349	13.0
12 years	960	25.3	523	19.5
>12 years	2287	60.2	1797	67.0
Missing	23	0.6	13	0.5
<u>History of diabetes</u>				
No	3690	97.2	2626	97.9
Yes	100	2.6	47	1.8
Missing	8	0.2	9	0.3
<u>History of hypertension</u>				
No	3137	82.6	2300	85.8
Yes	656	17.3	378	14.1
Missing	5	0.1	4	0.1
<u>Pre-pregnancy body mass index</u>				
Underweight (<18.5 kg/m ²)	158	4.2	97	3.6
Normal (18.5-24.9 kg/m ²)	1743	45.9	1270	47.4
Overweight (25.0-29.9 kg/m ²)	887	23.4	615	22.9

Obese (≥ 30.0 kg/m ²)	858	22.6	583	21.7
Missing	152	4.0	117	4.4
<u>Periconception smoking</u>				
No	3167	83.4	2306	86.0
Yes	618	16.3	370	13.8
Missing	13	0.3	6	0.2
<u>Periconception alcohol use</u>				
No	2171	57.2	1504	56.1
Yes	1596	42.0	1165	43.4
Missing	31	0.8	13	0.5
<u>Periconception multivitamin, prenatal, or folic acid use</u>				
No	246	6.5	150	5.6
Yes	3548	93.4	2530	94.3
Missing	4	0.1	2	0.1

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; NBDPS, National Birth Defects Prevention Study

eTable 3: Categories of physical activity and sitting among mothers of birth defect cases and controls, NBDPS (2008-2011) and BD-STEPS (2014-2018)

Physical Activity Characteristics	Mothers of Cases (n=3702)		Mothers of Controls (n=2636)	
	N	%	N	%
<u>Walking, minutes/week</u>				
Tertile 1 (< 120)	1138	30.7	815	30.9
Tertile 2 (120-420)	1511	40.8	1087	41.2
Tertile 3 (> 420)	1053	28.4	734	27.8
<u>Moderate activity, minutes/week</u>				
Tertile 1 (< 105)	1212	32.7	838	31.8
Tertile 2 (105-420)	1345	36.3	949	36.0
Tertile 3 (> 420)	1145	30.9	849	32.2
<u>Vigorous activity, minutes/week</u>				
Tertile 1 (<30)	1223	33.0	836	31.7
Tertile 2 (30-150)	1227	33.1	904	34.3
Tertile 3 (> 150)	1252	33.8	896	34.0
<u>Total, minutes/week</u>				
Tertile 1 (< 440)	1233	33.3	859	32.6
Tertile 2 (440-1380)	1179	31.8	884	33.5
Tertile 3 (> 1380)	1290	34.8	893	33.9
<u>Total MET-minutes/week*</u>				
Tertile 1 (< 1998)	1249	33.7	868	32.9
Tertile 2 (1998-6078)	1168	31.6	873	33.1
Tertile 3 (> 6078)	1285	34.7	895	34.0
Sitting Characteristics	Mothers of Cases (n=3779)		Mothers of Controls (n=2668)	
	N	%	N	%
<u>Sitting, hours/day</u>				
Tertile 1 (< 2)	642	17.0	468	17.5
Tertile 2 (2-5)	2081	55.1	1407	52.7
Tertile 3 (>5)	1056	27.9	793	29.7

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; MET, metabolic equivalent of task; NBDPS, National Birth Defects Prevention Study

Note: The tertile cutpoints were based on the distribution among the controls. Some exposures have uneven sample sizes among the controls due to the distribution of the variable.

*To calculate MET-minutes/week of PA, we multiplied time spent in each activity by its metabolic equivalent (MET) value (walking=3.3; moderate activity=4.0; vigorous activity=8.0), and then summed across activities for total MET-minutes/week.

eTable 4. Characteristics of controls by total physical activity in minutes/week; NBDPS (2008-2011) and BD-STEPS (2014-2018)

	Total Physical Activity (minutes/week)					
	<440 (n=859)		440-1380 (n=884)		>1380 (n=893)	
	N	%	N	%	N	%
<u>Center</u>						
Arkansas	90	10.5	88	10.0	134	15.0
California	75	8.7	64	7.2	67	7.5
Iowa	108	12.6	124	14.0	116	13.0
Massachusetts	92	10.7	123	13.9	125	14.0
New York	117	13.6	138	15.6	139	15.6
Texas	57	6.6	43	4.9	34	3.8
Georgia	109	12.7	122	13.8	130	14.6
North Carolina	124	14.4	107	12.1	98	11.0
Utah	87	10.1	75	8.5	50	5.6
<u>Maternal age at delivery</u>						
≤19 years	49	5.7	57	6.4	43	4.8
20-24 years	151	17.6	131	14.8	170	19.0
25-29 years	223	26.0	234	26.5	292	32.7
30-34 years	297	34.6	282	31.9	237	26.5
35-39 years	116	13.5	150	17.0	125	14.0
≥40 years	23	2.7	30	3.4	26	2.9
<u>Maternal race/ethnicity</u>						
Non-Hispanic White	449	52.3	511	57.8	513	57.4
Non-Hispanic Black	94	10.9	95	10.7	112	12.5
Hispanic	235	27.4	207	23.4	208	23.3
Other	80	9.3	70	7.9	60	6.7
Missing	1	0.1	1	0.1	0	0
<u>Maternal education</u>						
0-11 years	119	13.9	100	11.3	117	13.1
12 years	176	20.5	147	16.6	188	21.1
>12 years	556	64.7	636	71.9	586	65.6
Missing	8	0.9	1	0.1	2	0.2
<u>History of diabetes</u>						
No	842	98.0	867	98.1	872	97.6
Yes	14	1.6	16	1.8	17	1.9
Missing	3	0.3	1	0.1	4	0.4
<u>History of hypertension</u>						
No	740	86.1	755	85.4	766	85.8
Yes	117	13.6	128	14.5	127	14.2
Missing	2	0.2	1	0.1	0	0
<u>Pre-pregnancy body mass index</u>						

Underweight (<18.5 kg/m ²)	39	4.5	19	2.1	34	3.8
Normal (18.5-24.9 kg/m ²)	392	45.6	439	49.7	419	46.9
Overweight (25.0-29.9 kg/m ²)	189	22.0	207	23.4	212	23.7
Obese (≥30.0 kg/m ²)	187	21.8	185	20.9	200	22.4
Missing	52	6.1	34	3.8	28	3.1
<u>Periconception smoking</u>						
No	761	88.6	769	87.0	735	82.3
Yes	93	10.8	115	13.0	157	17.6
Missing	5	0.6	0	0	1	0.1
<u>Periconception alcohol use</u>						
No	519	60.4	473	53.5	483	54.1
Yes	333	38.8	409	46.3	407	45.6
Missing	7	0.8	2	0.2	3	0.3
<u>Periconception multivitamin, prenatal, or folic acid use</u>						
No	52	6.1	43	4.9	51	5.7
Yes	807	93.9	839	94.9	842	94.3
Missing	0	0	2	0.2	0	0

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; NBDPS, National Birth Defects Prevention Study

eTable 5. Characteristics of controls by time spent sitting in hours/day; NBDPS (2008-2011) and BD-STEPS (2014-2018)

	Sitting (hours/day)					
	<2 (n=468)		2-5 (n=1407)		>5 (n=793)	
	N	%	N	%	N	%
<u>Center</u>						
Arkansas	59	12.6	170	12.1	92	11.6
California	55	11.8	107	7.6	43	5.4
Iowa	46	9.8	184	13.1	120	15.1
Massachusetts	58	12.4	163	11.6	122	15.4
New York	87	18.6	224	15.9	95	12.0
Texas	42	9.0	63	4.5	30	3.8
Georgia	44	9.4	198	14.1	120	15.1
North Carolina	39	8.3	183	13.0	108	13.6
Utah	38	8.1	115	8.2	63	7.9
<u>Maternal age at delivery</u>						
≤19 years	37	7.9	73	5.2	41	5.2
20-24 years	93	19.9	239	17.0	125	15.8
25-29 years	117	25.0	434	30.8	209	26.4
30-34 years	134	28.6	404	28.7	281	35.4
35-39 years	73	15.6	211	15.0	114	14.4
≥40 years	14	3.0	46	3.3	23	2.9
<u>Maternal race/ethnicity</u>						
Non-Hispanic White	175	37.4	832	59.1	478	60.3
Non-Hispanic Black	47	10.0	152	10.8	106	13.4
Hispanic	217	46.4	321	22.8	126	15.9
Other	28	6.0	102	7.2	82	10.3
Missing	1	0.2	0	0	1	0.1
<u>Maternal education</u>						
0-11 years	138	29.5	157	11.2	53	6.7
12 years	123	26.3	282	20.0	113	14.2
>12 years	204	43.6	962	68.4	624	78.7
Missing	3	0.6	6	0.4	3	0.4
<u>History of diabetes</u>						
No	450	96.2	1379	98.0	784	98.9
Yes	14	3.0	27	1.9	5	0.6
Missing	4	0.9	1	0.1	4	0.5
<u>History of hypertension</u>						
No	398	85.0	1224	87.0	666	84.0
Yes	68	14.5	182	12.9	126	15.9
Missing	2	0.4	1	0.1	1	0.1
<u>Pre-pregnancy body mass index</u>						

Underweight (<18.5 kg/m ²)	16	3.4	53	3.8	27	3.4
Normal (18.5-24.9 kg/m ²)	199	42.5	688	48.9	381	48.0
Overweight (25.0-29.9 kg/m ²)	97	20.7	323	23.0	188	23.7
Obese (≥30.0 kg/m ²)	100	21.4	296	21.0	184	23.2
Missing	56	12.0	47	3.3	13	1.6
<u>Periconception smoking</u>						
No	424	90.6	1205	85.6	670	84.5
Yes	42	9.0	201	14.3	121	15.3
Missing	2	0.4	1	0.1	2	0.3
<u>Periconception alcohol use</u>						
No	331	70.7	783	55.7	383	48.3
Yes	133	28.4	621	44.1	405	51.1
Missing	4	0.9	3	0.2	5	0.6
<u>Periconception multivitamin, prenatal, or folic acid use</u>						
No	36	7.7	74	5.3	39	4.9
Yes	432	92.3	1333	94.7	752	94.8
Missing	0	0	0	0	2	0.3

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; NBDPS, National Birth Defects Prevention Study

eTable 6: Spearman correlation coefficients with 95% confidence intervals between physical activity and sitting time among all participants; NBDPS (2008-2011) and BD-STEPS (2014-2018)

	Spearman correlation coefficient (95% confidence interval)					
Measure	Walking minutes/ week	Moderate minutes/ week	Vigorous minutes/ week	Total minutes/ week	Total MET-minutes/ week	Sitting hours/day
Walking minutes/ week	1.00					
Moderate minutes/ week	0.34 (0.32, 0.36)	1.00				
Vigorous minutes/ week	0.28 (0.26, 0.30)	0.29 (0.27, 0.31)	1.00			
Total minutes/ week	0.73 (0.72, 0.74)	0.76 (0.75, 0.77)	0.48 (0.46, 0.50)	1.00		
Total MET-minutes/ week	0.67 (0.66, 0.69)	0.75 (0.74, 0.76)	0.58 (0.56, 0.59)	0.99 (0.99, 0.99)	1.00	
Sitting hours/ day	-0.06 (-0.08, -0.03)	-0.12 (-0.15, -0.10)	-0.05 (-0.07, -0.02)	-0.13 (-0.15, -0.10)	-0.13 (-0.15, -0.10)	1.00

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study

eTable 7: Categories of physical activity and sitting among cases by birth defect category; NBDPS (2008-2011) and BD-STEPS (2014-2018)

Physical Activity Characteristics	Anencephaly (n=102)*		Spina bifida (n=331)		Anotia/microtia (n=216)		Cleft palate (n=398)		Cleft lip with and without cleft palate (n=778)		Esophageal atresia (n=221)	
	N	%	N	%	N	%	N	%	N	%	N	%
<u>Walking, min/week</u>												
Tertile 1 (< 120)	26	25.5	103	31.1	65	30.1	116	29.1	226	29.0	71	32.1
Tertile 2 (120-420)	53	52.0	130	39.3	93	43.1	151	37.9	319	41.0	89	40.3
Tertile 3 (> 420)	23	22.5	98	29.6	58	26.9	131	32.9	233	29.9	61	27.6
<u>Moderate, min/week</u>												
Tertile 1 (< 105)	33	32.4	114	34.4	70	32.4	131	32.9	240	30.8	66	29.9
Tertile 2 (105-420)	37	36.3	131	39.6	86	39.8	136	34.2	272	35.0	83	37.6
Tertile 3 (> 420)	32	31.4	86	26.0	60	27.8	131	32.9	266	34.2	72	32.6
<u>Vigorous, min/week</u>												
Tertile 1 (<30)	32	31.4	109	32.9	86	39.8	145	36.4	258	33.2	67	30.3
Tertile 2 (30-150)	36	35.3	118	35.6	60	27.8	120	30.2	267	34.3	69	31.2
Tertile 3 (> 150)	34	33.3	104	31.4	70	32.4	133	33.4	253	32.5	85	38.5
<u>Total, min/week</u>												
Tertile 1 (< 440)	37	36.3	121	36.6	73	33.8	121	30.4	240	30.8	71	32.1
Tertile 2 (440-1380)	29	28.4	102	30.8	73	33.8	131	32.9	244	31.4	67	30.3
Tertile 3 (> 1380)	36	35.3	108	32.6	70	32.4	146	36.7	294	37.8	83	37.6
<u>Total MET-min/week</u>												
Tertile 1 (< 1998)	39	38.2	112	33.8	74	34.3	134	33.7	250	32.1	73	33.0
Tertile 2 (1998-6078)	27	26.5	119	36.0	72	33.3	117	29.4	239	30.7	63	28.5
Tertile 3 (> 6078)	36	35.3	100	30.2	70	32.4	147	36.9	289	37.1	85	38.5
Sitting Characteristics	Anencephaly (n=102)*		Spina bifida (n=338)		Anotia/microtia (n=220)		Cleft palate (n=407)		Cleft lip with and without cleft palate (n=801)		Esophageal atresia (n=228)	
	N	%	N	%	N	%	N	%	N	%	N	%
<u>Sitting, hours/day</u>												
Tertile 1 (< 2)	15	14.7	62	18.3	52	23.6	69	17.0	157	19.6	30	13.2
Tertile 2 (2-5)	62	60.8	184	54.4	124	56.4	218	53.6	457	57.1	136	59.6
Tertile 3 (>5)	25	24.5	92	27.2	44	20.0	120	29.5	187	23.3	62	27.2

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study

*Data on these birth defects were collected from NBDPS only.

eTable 7: Categories of physical activity and sitting among cases by birth defect category; NBDPS (2008-2011) and BD-STEPS (2014-2018) (continued)

Physical Activity Characteristics	Anorectal atresia (n=108)*		Hypospadias (n=516)*		Transverse limb deficiency (n=136)		Craniosynostosis (n=325)*		Diaphragmatic hernia (n=226)		Gastroschisis (n=402)	
	N	%	N	%	N	%	N	%	N	%	N	%
<u>Walking, min/week</u>												
Tertile 1 (< 120)	40	37.0	178	34.5	53	39.0	108	33.2	67	29.6	108	26.9
Tertile 2 (120-420)	36	33.3	229	44.4	45	33.1	137	42.2	94	41.6	148	36.8
Tertile 3 (> 420)	32	29.6	109	21.1	38	27.9	80	24.6	65	28.8	146	36.3
<u>Moderate, min/week</u>												
Tertile 1 (< 105)	36	33.3	196	38.0	50	36.8	103	31.7	77	34.1	116	28.9
Tertile 2 (105-420)	44	40.7	184	35.7	49	36.0	121	37.2	77	34.1	145	36.1
Tertile 3 (> 420)	28	25.9	136	26.4	37	27.2	101	31.1	72	31.9	141	35.1
<u>Vigorous, min/week</u>												
Tertile 1 (<30)	50	46.3	158	30.6	44	32.4	99	30.5	78	34.5	121	30.1
Tertile 2 (30-150)	24	22.2	195	37.8	45	33.1	122	37.5	73	32.3	115	28.6
Tertile 3 (> 150)	34	31.5	163	31.6	47	34.6	104	32.0	75	33.2	166	41.3
<u>Total, min/week</u>												
Tertile 1 (< 440)	44	40.7	198	38.4	58	42.6	114	35.1	71	31.4	103	25.6
Tertile 2 (440-1380)	28	25.9	176	34.1	31	22.8	110	33.8	71	31.4	134	33.3
Tertile 3 (> 1380)	36	33.3	142	27.5	47	34.6	101	31.1	84	37.2	165	41.0
<u>Total MET-min/week</u>												
Tertile 1 (< 1998)	44	40.7	186	36.0	55	40.4	114	35.1	73	32.3	114	28.4
Tertile 2 (1998-6078)	28	25.9	185	35.9	34	25.0	112	34.5	70	31.0	120	29.9
Tertile 3 (> 6078)	36	33.3	145	28.1	47	34.6	99	30.5	83	36.7	168	41.8
Sitting Characteristics	Anorectal atresia (n=107)*		Hypospadias (n=521)*		Transverse limb deficiency (n=142)		Craniosynostosis (n=331)*		Diaphragmatic hernia (n=234)		Gastroschisis (n=407)	
	N	%	N	%	N	%	N	%	N	%	N	%
<u>Sitting, hours/day</u>												
Tertile 1 (< 2)	12	11.2	79	15.2	30	21.1	52	15.7	33	14.1	62	15.2
Tertile 2 (2-5)	62	57.9	259	49.7	73	51.4	176	53.2	135	57.7	233	57.2
Tertile 3 (>5)	33	30.8	183	35.1	39	27.5	103	31.1	66	28.2	112	27.5

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposures; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study

*Data on these birth defects were collected from NBDPS only.

eTable 8: Association of physical activity and sitting with birth defects; NBDPS (2008-2011) and BD-STEPS (2014-2018)

	Spina Bifida (Physical Activity n=331 cases) (Sitting n=338 cases)			Anotia and Microtia (Physical Activity n=216 cases) (Sitting n=220 cases)		
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.95 (0.72, 1.24)	1.00 (0.76, 1.33)	1.00 (0.75, 1.34)	1.07 (0.77, 1.49)	1.15 (0.82, 1.61)	1.19 (0.83, 1.71)
Tertile 3	1.06 (0.79, 1.42)	1.09 (0.81, 1.47)	1.09 (0.80, 1.48)	0.99 (0.69, 1.43)	1.07 (0.73, 1.57)	1.10 (0.74, 1.64)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.01 (0.78, 1.33)	1.01 (0.77, 1.32)	0.99 (0.75, 1.32)	1.08 (0.78, 1.51)	1.12 (0.80, 1.58)	1.12 (0.78, 1.61)
Tertile 3	0.74 (0.55, 1.00)	0.73 (0.54, 0.99)	0.74 (0.54, 1.01)	0.85 (0.59, 1.21)	0.89 (0.62, 1.29)	0.87 (0.59, 1.28)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.00 (0.76, 1.32)	1.13 (0.85, 1.51)	1.14 (0.85, 1.52)	0.65 (0.46, 0.91)	0.90 (0.63, 1.29)	0.97 (0.67, 1.42)
Tertile 3	0.89 (0.67, 1.18)	0.90 (0.67, 1.21)	0.87 (0.64, 1.18)	0.76 (0.55, 1.06)	0.89 (0.63, 1.26)	0.93 (0.64, 1.33)
<u>Total in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.82 (0.62, 1.08)	0.82 (0.62, 1.08)	0.82 (0.62, 1.11)	0.97 (0.69, 1.36)	1.04 (0.74, 1.48)	1.03 (0.71, 1.48)
Tertile 3	0.86 (0.65, 1.13)	0.84 (0.64, 1.11)	0.85 (0.63, 1.13)	0.92 (0.66, 1.30)	0.97 (0.68, 1.38)	0.94 (0.65, 1.37)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.06 (0.80, 1.39)	1.07 (0.81, 1.41)	1.04 (0.78, 1.39)	0.97 (0.69, 1.36)	1.09 (0.77, 1.54)	1.06 (0.73, 1.53)
Tertile 3	0.87 (0.65, 1.15)	0.85 (0.63, 1.13)	0.84 (0.62, 1.13)	0.92 (0.65, 1.29)	0.97 (0.68, 1.38)	0.93 (0.64, 1.35)
<u>Sitting in hours/day</u>						
Tertile 1	1.14 (0.81, 1.61)	0.95 (0.66, 1.36)	0.94 (0.64, 1.37)	2.00 (1.32, 3.04)	1.25 (0.80, 1.95)	1.23 (0.77, 1.96)
Tertile 2	1.13 (0.86, 1.47)	1.09 (0.83, 1.42)	1.11 (0.84, 1.45)	1.59 (1.11, 2.26)	1.38 (0.96, 1.98)	1.31 (0.90, 1.89)
Tertile 3	1	1	1	1	1	1

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

* Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

** Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 8: Association of physical activity and sitting with birth defects; NBDPS (2008-2011) and BD-STEPS (2014-2018) (continued)

	Cleft Palate (Physical Activity n=398 cases) (Sitting n=407 cases)			Cleft Lip with and without Cleft Palate (Physical Activity n=778 cases) (Sitting n=801 cases)		
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.98 (0.75, 1.26)	0.93 (0.72, 1.21)	0.94 (0.72, 1.23)	1.06 (0.87, 1.28)	1.09 (0.90, 1.33)	1.08 (0.88, 1.32)
Tertile 3	1.25 (0.96, 1.64)	1.20 (0.91, 1.57)	1.21 (0.92, 1.60)	1.14 (0.93, 1.41)	1.16 (0.94, 1.43)	1.13 (0.91, 1.40)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.92 (0.71, 1.19)	0.88 (0.68, 1.15)	0.86 (0.66, 1.12)	1.00 (0.82, 1.22)	1.00 (0.82, 1.23)	0.95 (0.78, 1.17)
Tertile 3	0.99 (0.76, 1.28)	0.91 (0.70, 1.19)	0.88 (0.67, 1.15)	1.09 (0.90, 1.33)	1.10 (0.90, 1.35)	1.06 (0.86, 1.30)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.77 (0.59, 0.99)	0.75 (0.57, 0.98)	0.77 (0.59, 1.01)	0.96 (0.79, 1.16)	1.04 (0.84, 1.27)	1.05 (0.85, 1.29)
Tertile 3	0.86 (0.66, 1.10)	0.85 (0.66, 1.11)	0.87 (0.67, 1.13)	0.91 (0.75, 1.11)	0.94 (0.77, 1.15)	0.92 (0.74, 1.13)
<u>Total in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.05 (0.81, 1.37)	1.03 (0.79, 1.34)	1.03 (0.78, 1.35)	0.99 (0.81, 1.21)	1.01 (0.82, 1.24)	1.00 (0.81, 1.23)
Tertile 3	1.16 (0.90, 1.50)	1.11 (0.85, 1.44)	1.10 (0.84, 1.43)	1.18 (0.97, 1.43)	1.18 (0.97, 1.44)	1.16 (0.95, 1.42)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.87 (0.67, 1.13)	0.85 (0.65, 1.11)	0.83 (0.63, 1.09)	0.95 (0.78, 1.16)	0.98 (0.80, 1.20)	0.95 (0.77, 1.17)
Tertile 3	1.06 (0.83, 1.37)	1.01 (0.78, 1.30)	1.00 (0.77, 1.29)	1.12 (0.92, 1.36)	1.12 (0.92, 1.36)	1.10 (0.90, 1.34)
<u>Sitting in hours/day</u>						
Tertile 1	0.97 (0.71, 1.34)	0.95 (0.68, 1.32)	0.98 (0.70, 1.37)	1.42 (1.12, 1.81)	1.25 (0.97, 1.61)	1.25 (0.96, 1.62)
Tertile 2	1.02 (0.81, 1.30)	0.98 (0.77, 1.26)	0.97 (0.76, 1.24)	1.38 (1.14, 1.67)	1.33 (1.10, 1.62)	1.33 (1.09, 1.62)
Tertile 3	1	1	1	1	1	1

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

* Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

** Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 8: Association of physical activity and sitting with birth defects; NBDPS (2008-2011) and BD-STEPS (2014-2018) (continued)

	Esophageal Atresia (Physical Activity n=221 cases) (Sitting n=228 cases)			Transverse Limb Deficiency (Physical Activity n=136 cases) (Sitting n=142 cases)		
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.94 (0.68, 1.30)	0.96 (0.69, 1.33)	0.95 (0.68, 1.32)	0.64 (0.42, 0.96)	0.63 (0.42, 0.95)	0.66 (0.43, 1.00)
Tertile 3	0.95 (0.67, 1.36)	0.98 (0.68, 1.41)	0.98 (0.68, 1.41)	0.80 (0.52, 1.22)	0.76 (0.49, 1.18)	0.76 (0.49, 1.19)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.11 (0.79, 1.55)	1.11 (0.79, 1.56)	1.08 (0.76, 1.52)	0.87 (0.58, 1.30)	0.87 (0.58, 1.30)	0.92 (0.61, 1.40)
Tertile 3	1.08 (0.76, 1.52)	1.06 (0.74, 1.51)	1.01 (0.71, 1.45)	0.73 (0.47, 1.13)	0.73 (0.47, 1.13)	0.77 (0.49, 1.21)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.95 (0.67, 1.35)	0.94 (0.66, 1.35)	0.92 (0.64, 1.32)	0.95 (0.62, 1.45)	0.93 (0.60, 1.43)	0.90 (0.57, 1.40)
Tertile 3	1.18 (0.85, 1.65)	1.15 (0.82, 1.62)	1.11 (0.79, 1.57)	1.00 (0.65, 1.52)	0.96 (0.62, 1.47)	0.96 (0.62, 1.48)
<u>Total in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.92 (0.65, 1.30)	0.89 (0.62, 1.26)	0.87 (0.61, 1.24)	0.52 (0.33, 0.81)	0.52 (0.33, 0.82)	0.54 (0.35, 0.85)
Tertile 3	1.12 (0.81, 1.56)	1.09 (0.78, 1.53)	1.05 (0.75, 1.48)	0.78 (0.52, 1.16)	0.77 (0.52, 1.16)	0.78 (0.52, 1.17)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.86 (0.60, 1.22)	0.83 (0.58, 1.18)	0.83 (0.58, 1.18)	0.61 (0.40, 0.95)	0.62 (0.40, 0.96)	0.63 (0.40, 0.99)
Tertile 3	1.13 (0.81, 1.57)	1.07 (0.77, 1.50)	1.05 (0.75, 1.46)	0.83 (0.56, 1.24)	0.82 (0.55, 1.24)	0.83 (0.55, 1.25)
<u>Sitting in hours/day</u>						
Tertile 1	0.82 (0.52, 1.29)	0.79 (0.49, 1.26)	0.85 (0.53, 1.36)	1.30 (0.80, 2.13)	1.26 (0.76, 2.11)	1.25 (0.74, 2.10)
Tertile 2	1.24 (0.90, 1.69)	1.22 (0.89, 1.67)	1.17 (0.85, 1.60)	1.05 (0.71, 1.57)	1.00 (0.67, 1.49)	0.99 (0.66, 1.49)
Tertile 3	1	1	1	1	1	1

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposures; CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

* Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

** Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 8: Association of physical activity and sitting with birth defects; NBDPS (2008-2011) and BD-STEPS (2014-2018) (continued)

	Diaphragmatic Hernia (Physical Activity n=226 cases) (Sitting n=234 cases)			Gastroschisis (Physical Activity n=402 cases) (Sitting n=407 cases)		
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.05 (0.76, 1.46)	1.07 (0.77, 1.49)	1.05 (0.75, 1.48)	1.03 (0.79, 1.34)	1.00 (0.75, 1.33)	1.04 (0.78, 1.40)
Tertile 3	1.08 (0.75, 1.54)	1.08 (0.75, 1.55)	1.06 (0.73, 1.53)	1.50 (1.15, 1.96)	1.35 (1.01, 1.81)	1.37 (1.02, 1.85)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.88 (0.64, 1.23)	0.88 (0.63, 1.23)	0.83 (0.59, 1.18)	1.10 (0.85, 1.43)	1.23 (0.92, 1.63)	1.24 (0.93, 1.66)
Tertile 3	0.92 (0.66, 1.29)	0.92 (0.66, 1.29)	0.92 (0.65, 1.30)	1.20 (0.92, 1.56)	1.42 (1.07, 1.90)	1.41 (1.05, 1.90)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.87 (0.62, 1.21)	0.92 (0.65, 1.30)	0.92 (0.65, 1.31)	0.88 (0.67, 1.15)	0.87 (0.65, 1.17)	0.86 (0.64, 1.17)
Tertile 3	0.90 (0.64, 1.25)	0.91 (0.65, 1.27)	0.94 (0.66, 1.32)	1.28 (0.99, 1.65)	1.08 (0.82, 1.42)	1.07 (0.81, 1.42)
<u>Total in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.97 (0.69, 1.37)	0.98 (0.69, 1.38)	0.94 (0.65, 1.35)	1.26 (0.96, 1.66)	1.29 (0.96, 1.73)	1.28 (0.95, 1.74)
Tertile 3	1.14 (0.82, 1.58)	1.13 (0.81, 1.58)	1.14 (0.81, 1.60)	1.54 (1.18, 2.00)	1.48 (1.11, 1.97)	1.48 (1.10, 1.98)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.95 (0.68, 1.34)	0.98 (0.70, 1.39)	0.96 (0.67, 1.37)	1.05 (0.80, 1.38)	1.07 (0.79, 1.43)	1.05 (0.77, 1.42)
Tertile 3	1.10 (0.79, 1.53)	1.08 (0.78, 1.51)	1.10 (0.78, 1.55)	1.43 (1.11, 1.85)	1.39 (1.05, 1.83)	1.38 (1.04, 1.84)
<u>Sitting in hours/day</u>						
Tertile 1	0.85 (0.55, 1.31)	0.72 (0.46, 1.13)	0.77 (0.48, 1.23)	0.94 (0.67, 1.31)	0.83 (0.58, 1.20)	0.87 (0.60, 1.27)
Tertile 2	1.15 (0.85, 1.57)	1.11 (0.81, 1.52)	1.09 (0.80, 1.50)	1.17 (0.92, 1.49)	1.08 (0.83, 1.40)	1.06 (0.81, 1.38)
Tertile 3	1	1	1	1	1	1

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposures; CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

* Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

** Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 9: Association of physical activity and sitting with birth defects; NBDPS (2008-2011)

	Anencephaly (Physical Activity n=102 cases) (Sitting n=102 cases)			Spina Bifida (Physical Activity n=331 cases) (Sitting n=338 cases)		
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.70 (1.05, 2.76)	1.73 (1.06, 2.84)	1.69 (1.03, 2.77)	0.94 (0.66, 1.35)	1.04 (0.72, 1.50)	1.04 (0.71, 1.52)
Tertile 3	1.23 (0.69, 2.20)	1.17 (0.65, 2.11)	1.14 (0.63, 2.05)	0.73 (0.47, 1.14)	0.79 (0.50, 1.23)	0.76 (0.47, 1.22)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.07 (0.66, 1.74)	1.06 (0.64, 1.74)	1.01 (0.61, 1.66)	1.12 (0.79, 1.60)	1.13 (0.79, 1.63)	1.13 (0.77, 1.66)
Tertile 3	1.18 (0.71, 1.94)	1.14 (0.68, 1.91)	1.07 (0.64, 1.81)	0.58 (0.37, 0.91)	0.59 (0.38, 0.94)	0.61 (0.38, 0.99)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.01 (0.62, 1.66)	1.07 (0.64, 1.78)	1.00 (0.60, 1.68)	1.16 (0.79, 1.70)	1.33 (0.89, 1.98)	1.29 (0.86, 1.95)
Tertile 3	1.06 (0.64, 1.74)	1.05 (0.63, 1.76)	1.00 (0.59, 1.68)	0.92 (0.61, 1.39)	0.97 (0.63, 1.48)	0.89 (0.57, 1.39)
<u>Total in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.82 (0.49, 1.35)	0.86 (0.52, 1.43)	0.85 (0.51, 1.42)	0.85 (0.59, 1.23)	0.86 (0.59, 1.25)	0.87 (0.59, 1.29)
Tertile 3	1.14 (0.71, 1.83)	1.10 (0.68, 1.80)	1.04 (0.63, 1.70)	0.62 (0.41, 0.94)	0.64 (0.42, 0.97)	0.63 (0.40, 0.98)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.73 (0.44, 1.21)	0.74 (0.44, 1.23)	0.72 (0.43, 1.21)	1.07 (0.74, 1.54)	1.08 (0.75, 1.58)	1.07 (0.72, 1.58)
Tertile 3	1.07 (0.67, 1.71)	1.02 (0.63, 1.65)	0.96 (0.59, 1.56)	0.69 (0.45, 1.05)	0.70 (0.46, 1.08)	0.69 (0.44, 1.08)
<u>Sitting in hours/day</u>						
Tertile 1	0.86 (0.44, 1.65)	0.70 (0.35, 1.43)	0.77 (0.38, 1.57)	1.20 (0.73, 1.97)	1.03 (0.61, 1.73)	1.03 (0.60, 1.79)
Tertile 2	1.27 (0.79, 2.05)	1.26 (0.78, 2.04)	1.28 (0.79, 2.09)	1.33 (0.90, 1.97)	1.35 (0.91, 2.00)	1.41 (0.93, 2.11)
Tertile 3	1	1	1	1	1	1

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 9: Association of physical activity and sitting with birth defects; NBDPS (2008-2011) (continued)

	Anotia and Microtia (Physical Activity n=216 cases) (Sitting n=220 cases)						Cleft Palate (Physical Activity n=398 cases) (Sitting n=407 cases)					
	Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.79	(0.49, 1.26)	0.91	(0.56, 1.47)	0.84	(0.50, 1.41)	0.93	(0.66, 1.33)	0.85	(0.59, 1.21)	0.85	(0.59, 1.22)
Tertile 3	1.03	(0.62, 1.70)	1.09	(0.65, 1.84)	1.03	(0.59, 1.80)	1.20	(0.82, 1.76)	1.09	(0.74, 1.60)	1.10	(0.75, 1.62)
<u>Moderate activity in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.93	(0.60, 1.46)	0.97	(0.61, 1.54)	1.02	(0.62, 1.67)	0.77	(0.54, 1.09)	0.70	(0.49, 1.00)	0.69	(0.48, 0.99)
Tertile 3	0.55	(0.31, 0.96)	0.61	(0.34, 1.07)	0.57	(0.31, 1.06)	0.72	(0.50, 1.06)	0.65	(0.44, 0.95)	0.60	(0.40, 0.89)
<u>Vigorous activity in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.78	(0.47, 1.27)	0.97	(0.58, 1.63)	1.03	(0.59, 1.79)	0.86	(0.60, 1.24)	0.80	(0.54, 1.16)	0.82	(0.56, 1.20)
Tertile 3	0.97	(0.60, 1.57)	1.12	(0.68, 1.85)	1.16	(0.68, 2.00)	1.03	(0.71, 1.47)	0.94	(0.65, 1.37)	0.97	(0.67, 1.42)
<u>Total in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	1.07	(0.67, 1.70)	1.19	(0.74, 1.91)	1.21	(0.73, 2.01)	0.94	(0.66, 1.34)	0.88	(0.61, 1.26)	0.86	(0.60, 1.24)
Tertile 3	0.77	(0.46, 1.29)	0.81	(0.47, 1.39)	0.77	(0.43, 1.38)	0.97	(0.68, 1.40)	0.85	(0.59, 1.24)	0.83	(0.57, 1.21)
<u>Total intensity-weighted activity in MET-minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	1.11	(0.69, 1.76)	1.28	(0.79, 2.06)	1.32	(0.79, 2.20)	0.88	(0.61, 1.26)	0.83	(0.58, 1.20)	0.81	(0.56, 1.18)
Tertile 3	0.81	(0.48, 1.36)	0.86	(0.51, 1.47)	0.80	(0.45, 1.43)	0.95	(0.66, 1.37)	0.84	(0.58, 1.22)	0.82	(0.57, 1.20)
<u>Sitting in hours/day</u>												
Tertile 1	2.40	(1.33, 4.32)	1.68	(0.90, 3.12)	1.64	(0.86, 3.12)	1.05	(0.69, 1.61)	1.14	(0.73, 1.78)	1.12	(0.71, 1.76)
Tertile 2	1.40	(0.82, 2.40)	1.25	(0.72, 2.17)	1.11	(0.63, 1.96)	0.90	(0.64, 1.27)	0.89	(0.62, 1.26)	0.87	(0.61, 1.23)
Tertile 3	1		1		1		1		1		1	

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 9: Association of physical activity and sitting with birth defects; NBDPS (2008-2011) (continued)

	Cleft Lip with or without Cleft Palate (Physical Activity n=778 cases) (Sitting n=801 cases)			Esophageal Atresia (Physical Activity n=221 cases) (Sitting n=228 cases)		
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.87 (0.68, 1.13)	0.91 (0.70, 1.18)	0.92 (0.70, 1.20)	0.94 (0.60, 1.48)	0.94 (0.59, 1.49)	0.94 (0.59, 1.49)
Tertile 3	0.98 (0.74, 1.31)	1.00 (0.75, 1.34)	0.96 (0.72, 1.30)	1.14 (0.69, 1.86)	1.12 (0.67, 1.85)	1.11 (0.67, 1.84)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.98 (0.75, 1.27)	1.02 (0.78, 1.33)	0.97 (0.74, 1.27)	1.31 (0.82, 2.10)	1.30 (0.80, 2.10)	1.30 (0.80, 2.13)
Tertile 3	1.00 (0.76, 1.33)	1.06 (0.80, 1.41)	1.05 (0.79, 1.40)	1.36 (0.83, 2.23)	1.27 (0.77, 2.12)	1.27 (0.76, 2.12)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.16 (0.89, 1.51)	1.20 (0.91, 1.59)	1.19 (0.90, 1.58)	0.98 (0.61, 1.59)	0.98 (0.60, 1.61)	0.96 (0.58, 1.58)
Tertile 3	0.98 (0.74, 1.30)	0.99 (0.74, 1.32)	0.97 (0.73, 1.31)	1.20 (0.75, 1.93)	1.08 (0.66, 1.76)	1.07 (0.66, 1.75)
<u>Total in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.75 (0.57, 0.99)	0.78 (0.59, 1.03)	0.79 (0.59, 1.05)	0.93 (0.57, 1.51)	0.88 (0.54, 1.44)	0.86 (0.52, 1.42)
Tertile 3	1.05 (0.81, 1.37)	1.07 (0.81, 1.39)	1.05 (0.80, 1.38)	1.32 (0.84, 2.10)	1.18 (0.74, 1.88)	1.16 (0.72, 1.86)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.82 (0.63, 1.08)	0.86 (0.65, 1.13)	0.86 (0.65, 1.15)	0.81 (0.49, 1.32)	0.77 (0.47, 1.27)	0.80 (0.48, 1.32)
Tertile 3	1.06 (0.81, 1.38)	1.06 (0.81, 1.39)	1.05 (0.80, 1.39)	1.28 (0.81, 2.00)	1.10 (0.69, 1.75)	1.11 (0.70, 1.78)
<u>Sitting in hours/day</u>						
Tertile 1	1.41 (1.02, 1.95)	1.23 (0.87, 1.74)	1.21 (0.85, 1.72)	0.69 (0.35, 1.35)	0.68 (0.34, 1.36)	0.71 (0.35, 1.43)
Tertile 2	1.27 (0.97, 1.67)	1.24 (0.94, 1.63)	1.21 (0.92, 1.60)	1.42 (0.90, 2.24)	1.43 (0.90, 2.26)	1.39 (0.87, 2.21)
Tertile 3	1	1	1	1	1	1

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 9: Association of physical activity and sitting with birth defects; NBDPS (2008-2011) (continued)

	Anorectal Atresia/Stenosis (noncomplex) (Physical Activity n=108 cases) (Sitting n=107 cases)			Hypospadias, second/third degree (Physical Activity n=516 cases) (Sitting n=521 cases)		
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.75 (0.47, 1.20)	0.75 (0.47, 1.21)	0.76 (0.47, 1.22)	1.00 (0.78, 1.30)	0.90 (0.69, 1.17)	0.89 (0.68, 1.17)
Tertile 3	1.12 (0.69, 1.81)	1.16 (0.71, 1.89)	1.15 (0.70, 1.89)	0.78 (0.58, 1.06)	0.68 (0.50, 0.94)	0.67 (0.49, 0.93)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.17 (0.74, 1.84)	1.15 (0.73, 1.83)	1.03 (0.65, 1.66)	0.89 (0.68, 1.16)	0.78 (0.59, 1.03)	0.76 (0.58, 1.01)
Tertile 3	0.94 (0.57, 1.57)	0.97 (0.58, 1.62)	0.93 (0.55, 1.56)	0.82 (0.61, 1.08)	0.68 (0.51, 0.92)	0.67 (0.50, 0.90)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.43 (0.26, 0.71)	0.44 (0.26, 0.74)	0.44 (0.26, 0.73)	1.03 (0.78, 1.35)	0.91 (0.68, 1.21)	0.87 (0.65, 1.16)
Tertile 3	0.68 (0.43, 1.07)	0.68 (0.42, 1.07)	0.66 (0.42, 1.06)	0.90 (0.68, 1.19)	0.79 (0.58, 1.05)	0.74 (0.55, 1.00)
<u>Total in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.66 (0.41, 1.08)	0.65 (0.40, 1.07)	0.66 (0.40, 1.09)	0.75 (0.57, 0.98)	0.67 (0.51, 0.89)	0.67 (0.50, 0.88)
Tertile 3	0.95 (0.60, 1.51)	0.98 (0.62, 1.56)	0.97 (0.61, 1.56)	0.71 (0.53, 0.94)	0.59 (0.44, 0.80)	0.58 (0.43, 0.78)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.67 (0.41, 1.09)	0.66 (0.40, 1.09)	0.67 (0.40, 1.10)	0.86 (0.66, 1.13)	0.76 (0.58, 1.01)	0.75 (0.57, 1.00)
Tertile 3	0.95 (0.60, 1.50)	0.97 (0.61, 1.55)	0.96 (0.60, 1.55)	0.79 (0.59, 1.04)	0.66 (0.49, 0.89)	0.64 (0.48, 0.87)
<u>Sitting in hours/day</u>						
Tertile 1	0.52 (0.26, 1.02)	0.45 (0.22, 0.91)	0.42 (0.20, 0.89)	0.64 (0.45, 0.89)	0.80 (0.55, 1.14)	0.81 (0.56, 1.17)
Tertile 2	0.96 (0.62, 1.49)	0.93 (0.59, 1.44)	0.96 (0.62, 1.51)	0.68 (0.53, 0.87)	0.70 (0.54, 0.91)	0.69 (0.53, 0.90)
Tertile 3	1	1	1	1	1	1

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 9: Association of physical activity and sitting with birth defects; NBDPS (2008-2011) (continued)

	Transverse Limb Deficiency (Physical Activity n=136 cases) (Sitting n=142 cases)			Craniosynostosis (Physical Activity n=325 cases) (Sitting n=331 cases)		
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.60 (0.37, 0.99)	0.58 (0.35, 0.95)	0.60 (0.36, 0.99)	1.06 (0.80, 1.40)	1.00 (0.75, 1.33)	1.00 (0.75, 1.33)
Tertile 3	0.52 (0.28, 0.96)	0.50 (0.27, 0.93)	0.47 (0.25, 0.88)	1.03 (0.75, 1.42)	1.02 (0.74, 1.41)	1.04 (0.75, 1.44)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.60 (0.36, 1.02)	0.59 (0.35, 1.00)	0.64 (0.37, 1.09)	1.12 (0.84, 1.50)	1.07 (0.80, 1.43)	1.02 (0.76, 1.38)
Tertile 3	0.70 (0.41, 1.21)	0.71 (0.41, 1.23)	0.74 (0.42, 1.29)	1.19 (0.88, 1.61)	1.16 (0.85, 1.58)	1.12 (0.82, 1.54)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.93 (0.56, 1.56)	0.85 (0.50, 1.45)	0.79 (0.46, 1.35)	1.11 (0.83, 1.49)	1.01 (0.75, 1.37)	0.95 (0.70, 1.30)
Tertile 3	0.76 (0.44, 1.33)	0.71 (0.40, 1.25)	0.68 (0.38, 1.21)	1.05 (0.77, 1.42)	0.95 (0.70, 1.29)	0.93 (0.68, 1.28)
<u>Total in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.32 (0.18, 0.60)	0.31 (0.17, 0.58)	0.32 (0.17, 0.60)	1.01 (0.75, 1.34)	0.95 (0.71, 1.27)	0.93 (0.69, 1.25)
Tertile 3	0.65 (0.39, 1.07)	0.64 (0.38, 1.07)	0.61 (0.36, 1.03)	1.03 (0.77, 1.39)	1.01 (0.75, 1.36)	1.00 (0.74, 1.36)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.49 (0.28, 0.85)	0.47 (0.27, 0.83)	0.48 (0.27, 0.85)	1.03 (0.77, 1.38)	0.97 (0.72, 1.29)	0.95 (0.70, 1.28)
Tertile 3	0.68 (0.40, 1.14)	0.67 (0.39, 1.13)	0.64 (0.37, 1.10)	1.00 (0.75, 1.35)	0.97 (0.72, 1.32)	0.99 (0.73, 1.35)
<u>Sitting in hours/day</u>						
Tertile 1	1.50 (0.80, 2.81)	1.49 (0.78, 2.87)	1.49 (0.77, 2.90)	0.72 (0.50, 1.04)	0.83 (0.57, 1.22)	0.87 (0.59, 1.27)
Tertile 2	1.25 (0.74, 2.14)	1.23 (0.72, 2.10)	1.20 (0.70, 2.07)	0.87 (0.67, 1.15)	0.91 (0.69, 1.20)	0.93 (0.70, 1.22)
Tertile 3	1	1	1	1	1	1

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 9: Association of physical activity and sitting with birth defects; NBDPS (2008-2011) (continued)

	Diaphragmatic Hernia (Physical Activity n=226 cases) (Sitting n=234 cases)			Gastroschisis (Physical Activity n=402 cases) (Sitting n=407 cases)		
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.61 (0.38, 0.97)	0.63 (0.39, 1.01)	0.59 (0.37, 0.96)	1.05 (0.74, 1.47)	1.03 (0.71, 1.49)	1.06 (0.73, 1.55)
Tertile 3	0.89 (0.54, 1.45)	0.89 (0.54, 1.47)	0.79 (0.47, 1.32)	1.25 (0.86, 1.81)	1.17 (0.79, 1.75)	1.12 (0.74, 1.69)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.73 (0.46, 1.17)	0.74 (0.46, 1.18)	0.73 (0.45, 1.19)	1.02 (0.72, 1.44)	1.16 (0.80, 1.67)	1.19 (0.81, 1.74)
Tertile 3	0.79 (0.48, 1.29)	0.79 (0.48, 1.30)	0.80 (0.48, 1.32)	1.04 (0.73, 1.50)	1.35 (0.91, 2.00)	1.32 (0.88, 1.97)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.88 (0.55, 1.40)	0.87 (0.54, 1.42)	0.87 (0.53, 1.41)	0.90 (0.63, 1.29)	0.86 (0.58, 1.28)	0.86 (0.58, 1.29)
Tertile 3	0.76 (0.46, 1.25)	0.76 (0.46, 1.27)	0.69 (0.41, 1.16)	1.14 (0.81, 1.63)	0.99 (0.67, 1.45)	0.99 (0.67, 1.46)
<u>Total in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.83 (0.52, 1.35)	0.85 (0.52, 1.38)	0.83 (0.51, 1.36)	1.18 (0.83, 1.68)	1.21 (0.83, 1.77)	1.15 (0.78, 1.69)
Tertile 3	0.93 (0.58, 1.51)	0.93 (0.57, 1.51)	0.88 (0.53, 1.44)	1.18 (0.83, 1.70)	1.25 (0.85, 1.84)	1.18 (0.80, 1.76)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.89 (0.56, 1.43)	0.91 (0.56, 1.47)	0.89 (0.54, 1.44)	1.04 (0.73, 1.47)	1.05 (0.71, 1.53)	1.02 (0.69, 1.51)
Tertile 3	0.87 (0.53, 1.42)	0.86 (0.52, 1.42)	0.81 (0.49, 1.34)	1.14 (0.80, 1.62)	1.23 (0.84, 1.80)	1.19 (0.80, 1.75)
<u>Sitting in hours/day</u>						
Tertile 1	0.74 (0.40, 1.37)	0.70 (0.37, 1.35)	0.78 (0.41, 1.49)	0.80 (0.51, 1.27)	0.74 (0.45, 1.22)	0.75 (0.45, 1.25)
Tertile 2	0.99 (0.63, 1.55)	1.03 (0.65, 1.62)	1.00 (0.63, 1.58)	1.10 (0.79, 1.55)	1.04 (0.73, 1.50)	1.02 (0.70, 1.48)
Tertile 3	1	1	1	1	1	1

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 10: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011) and BD-STEPS (2014-2018)

	Spina Bifida (Physical Activity n=331 cases) (Sitting n=338 cases)						Anotia and Microtia (Physical Activity n=216 cases) (Sitting n=220 cases)					
	Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.98 (0.74, 1.31)		1.03 (0.77, 1.38)		1.04 (0.77, 1.41)		1.12 (0.76, 1.65)		1.21 (0.82, 1.81)		1.26 (0.82, 1.93)	
Tertile 3	1.10 (0.81, 1.50)		1.11 (0.81, 1.52)		1.12 (0.81, 1.56)		1.14 (0.74, 1.73)		1.21 (0.78, 1.87)		1.29 (0.81, 2.04)	
<u>Moderate activity in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.96 (0.72, 1.26)		0.95 (0.72, 1.26)		0.94 (0.70, 1.26)		0.99 (0.68, 1.44)		1.05 (0.71, 1.53)		1.04 (0.69, 1.57)	
Tertile 3	0.68 (0.50, 0.93)		0.66 (0.48, 0.91)		0.67 (0.48, 0.93)		0.69 (0.45, 1.05)		0.75 (0.49, 1.16)		0.72 (0.46, 1.15)	
<u>Vigorous activity in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	1.00 (0.75, 1.33)		1.12 (0.83, 1.51)		1.12 (0.83, 1.53)		0.71 (0.48, 1.05)		0.95 (0.63, 1.44)		1.06 (0.69, 1.63)	
Tertile 3	0.83 (0.61, 1.12)		0.84 (0.62, 1.14)		0.80 (0.58, 1.10)		0.76 (0.52, 1.12)		0.86 (0.57, 1.28)		0.89 (0.58, 1.38)	
<u>Total in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.77 (0.58, 1.04)		0.78 (0.58, 1.04)		0.78 (0.58, 1.07)		0.97 (0.66, 1.44)		1.04 (0.69, 1.55)		1.00 (0.65, 1.54)	
Tertile 3	0.80 (0.60, 1.07)		0.77 (0.58, 1.04)		0.78 (0.57, 1.05)		0.94 (0.64, 1.40)		0.99 (0.66, 1.48)		0.97 (0.63, 1.48)	
<u>Total intensity-weighted activity in MET-minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.97 (0.73, 1.29)		0.98 (0.73, 1.31)		0.95 (0.70, 1.28)		0.98 (0.66, 1.44)		1.09 (0.73, 1.62)		1.04 (0.68, 1.59)	
Tertile 3	0.81 (0.60, 1.08)		0.77 (0.57, 1.05)		0.76 (0.56, 1.04)		0.92 (0.62, 1.36)		0.96 (0.64, 1.44)		0.92 (0.60, 1.41)	
<u>Sitting in hours/day</u>												
Tertile 1	1.07 (0.75, 1.53)		0.88 (0.60, 1.29)		0.86 (0.58, 1.28)		1.90 (1.17, 3.08)		1.27 (0.76, 2.13)		1.26 (0.73, 2.16)	
Tertile 2	1.05 (0.80, 1.38)		1.01 (0.77, 1.34)		1.03 (0.77, 1.36)		1.54 (1.02, 2.31)		1.41 (0.93, 2.14)		1.32 (0.86, 2.02)	
Tertile 3	1		1		1		1		1		1	

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 10: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011) and BD-STEPS (2014-2018) (continued)

	Cleft Palate (Physical Activity n=398 cases) (Sitting n=407 cases)						Cleft Lip with or without Cleft Palate (Physical Activity n=778 cases) (Sitting n=801 cases)					
	Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.95 (0.72, 1.25)		0.91 (0.69, 1.20)		0.92 (0.70, 1.23)		1.12 (0.91, 1.37)		1.15 (0.94, 1.42)		1.13 (0.92, 1.40)	
Tertile 3	1.19 (0.89, 1.59)		1.13 (0.85, 1.52)		1.16 (0.86, 1.56)		1.14 (0.92, 1.43)		1.15 (0.92, 1.44)		1.11 (0.88, 1.40)	
<u>Moderate activity in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.96 (0.73, 1.27)		0.94 (0.71, 1.25)		0.92 (0.69, 1.23)		0.99 (0.80, 1.21)		0.99 (0.80, 1.22)		0.95 (0.77, 1.18)	
Tertile 3	1.01 (0.77, 1.34)		0.95 (0.71, 1.27)		0.92 (0.69, 1.23)		1.08 (0.87, 1.33)		1.09 (0.88, 1.34)		1.04 (0.83, 1.29)	
<u>Vigorous activity in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.77 (0.58, 1.02)		0.74 (0.56, 1.00)		0.77 (0.57, 1.03)		0.99 (0.81, 1.22)		1.05 (0.85, 1.30)		1.06 (0.85, 1.32)	
Tertile 3	0.89 (0.68, 1.16)		0.87 (0.66, 1.15)		0.89 (0.67, 1.18)		0.91 (0.74, 1.12)		0.92 (0.75, 1.14)		0.89 (0.71, 1.10)	
<u>Total in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	1.12 (0.84, 1.48)		1.08 (0.81, 1.44)		1.08 (0.81, 1.45)		0.97 (0.79, 1.20)		0.99 (0.80, 1.23)		0.97 (0.78, 1.21)	
Tertile 3	1.14 (0.86, 1.51)		1.09 (0.82, 1.44)		1.09 (0.81, 1.45)		1.15 (0.93, 1.41)		1.15 (0.93, 1.42)		1.11 (0.90, 1.38)	
<u>Total intensity-weighted activity in MET-minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.89 (0.67, 1.18)		0.85 (0.64, 1.14)		0.84 (0.63, 1.13)		0.92 (0.75, 1.14)		0.94 (0.76, 1.17)		0.91 (0.73, 1.13)	
Tertile 3	1.06 (0.80, 1.39)		0.99 (0.75, 1.31)		0.99 (0.75, 1.31)		1.10 (0.90, 1.35)		1.10 (0.89, 1.35)		1.06 (0.86, 1.31)	
<u>Sitting in hours/day</u>												
Tertile 1	0.90 (0.64, 1.26)		0.91 (0.63, 1.30)		0.92 (0.64, 1.33)		1.36 (1.06, 1.76)		1.24 (0.95, 1.61)		1.23 (0.93, 1.61)	
Tertile 2	0.97 (0.75, 1.26)		0.94 (0.73, 1.22)		0.92 (0.71, 1.20)		1.34 (1.10, 1.63)		1.31 (1.07, 1.61)		1.31 (1.07, 1.61)	
Tertile 3	1		1		1		1		1		1	

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 10: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011) and BD-STEPS (2014-2018) (continued)

	Esophageal Atresia (Physical Activity n=221 cases) (Sitting n=228 cases)						Transverse Limb Deficiency (Physical Activity n=136 cases) (Sitting n=142 cases)					
	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)	Model 1 Unadjusted OR (95% CI)	Model 2 Adjusted* OR (95% CI)	Model 3 Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>												
Tertile 1	1	1	1	1	1	1	1	1	1	1	1	1
Tertile 2	1.09 (0.71, 1.68)	1.12 (0.73, 1.74)	1.08 (0.69, 1.68)	0.68 (0.44, 1.05)	0.68 (0.44, 1.05)	0.72 (0.46, 1.12)	0.68 (0.44, 1.05)	0.68 (0.44, 1.05)	0.72 (0.46, 1.12)	0.68 (0.44, 1.05)	0.68 (0.44, 1.05)	0.72 (0.46, 1.12)
Tertile 3	1.05 (0.65, 1.69)	1.10 (0.68, 1.77)	1.10 (0.68, 1.78)	0.72 (0.44, 1.15)	0.69 (0.42, 1.12)	0.69 (0.42, 1.14)	0.72 (0.44, 1.15)	0.69 (0.42, 1.12)	0.69 (0.42, 1.14)	0.72 (0.44, 1.15)	0.69 (0.42, 1.12)	0.69 (0.42, 1.14)
<u>Moderate activity in minutes/week</u>												
Tertile 1	1	1	1	1	1	1	1	1	1	1	1	1
Tertile 2	1.11 (0.71, 1.75)	1.10 (0.70, 1.75)	1.03 (0.65, 1.64)	0.80 (0.51, 1.25)	0.81 (0.52, 1.26)	0.88 (0.56, 1.39)	0.80 (0.51, 1.25)	0.81 (0.52, 1.26)	0.88 (0.56, 1.39)	0.80 (0.51, 1.25)	0.81 (0.52, 1.26)	0.88 (0.56, 1.39)
Tertile 3	1.33 (0.85, 2.07)	1.30 (0.83, 2.06)	1.21 (0.76, 1.91)	0.76 (0.48, 1.20)	0.76 (0.47, 1.21)	0.82 (0.50, 1.33)	0.76 (0.48, 1.20)	0.76 (0.47, 1.21)	0.82 (0.50, 1.33)	0.76 (0.48, 1.20)	0.76 (0.47, 1.21)	0.82 (0.50, 1.33)
<u>Vigorous activity in minutes/week</u>												
Tertile 1	1	1	1	1	1	1	1	1	1	1	1	1
Tertile 2	0.90 (0.57, 1.42)	0.90 (0.56, 1.45)	0.88 (0.55, 1.42)	0.88 (0.55, 1.39)	0.88 (0.55, 1.41)	0.84 (0.52, 1.36)	0.88 (0.55, 1.39)	0.88 (0.55, 1.41)	0.84 (0.52, 1.36)	0.88 (0.55, 1.39)	0.88 (0.55, 1.41)	0.84 (0.52, 1.36)
Tertile 3	1.17 (0.76, 1.80)	1.18 (0.76, 1.83)	1.12 (0.72, 1.76)	0.93 (0.59, 1.47)	0.90 (0.57, 1.44)	0.90 (0.57, 1.44)	0.93 (0.59, 1.47)	0.90 (0.57, 1.44)	0.90 (0.57, 1.44)	0.93 (0.59, 1.47)	0.90 (0.57, 1.44)	0.90 (0.57, 1.44)
<u>Total in minutes/week</u>												
Tertile 1	1	1	1	1	1	1	1	1	1	1	1	1
Tertile 2	0.77 (0.49, 1.22)	0.75 (0.47, 1.20)	0.70 (0.44, 1.13)	0.52 (0.33, 0.85)	0.53 (0.33, 0.86)	0.56 (0.34, 0.91)	0.52 (0.33, 0.85)	0.53 (0.33, 0.86)	0.56 (0.34, 0.91)	0.52 (0.33, 0.85)	0.53 (0.33, 0.86)	0.56 (0.34, 0.91)
Tertile 3	1.10 (0.72, 1.67)	1.08 (0.71, 1.66)	1.01 (0.66, 1.55)	0.73 (0.47, 1.13)	0.73 (0.47, 1.13)	0.73 (0.47, 1.15)	0.73 (0.47, 1.13)	0.73 (0.47, 1.13)	0.73 (0.47, 1.15)	0.73 (0.47, 1.13)	0.73 (0.47, 1.13)	0.73 (0.47, 1.15)
<u>Total intensity-weighted activity in MET-minutes/week</u>												
Tertile 1	1	1	1	1	1	1	1	1	1	1	1	1
Tertile 2	0.79 (0.50, 1.24)	0.77 (0.48, 1.22)	0.75 (0.47, 1.20)	0.61 (0.38, 0.98)	0.62 (0.39, 1.00)	0.64 (0.40, 1.04)	0.61 (0.38, 0.98)	0.62 (0.39, 1.00)	0.64 (0.40, 1.04)	0.61 (0.38, 0.98)	0.62 (0.39, 1.00)	0.64 (0.40, 1.04)
Tertile 3	1.11 (0.73, 1.68)	1.08 (0.71, 1.66)	1.03 (0.67, 1.59)	0.80 (0.52, 1.24)	0.80 (0.52, 1.25)	0.81 (0.52, 1.28)	0.80 (0.52, 1.24)	0.80 (0.52, 1.25)	0.81 (0.52, 1.28)	0.80 (0.52, 1.24)	0.80 (0.52, 1.25)	0.81 (0.52, 1.28)
<u>Sitting in hours/day</u>												
Tertile 1	0.85 (0.48, 1.51)	0.88 (0.48, 1.60)	0.94 (0.52, 1.71)	1.43 (0.85, 2.42)	1.37 (0.79, 2.38)	1.34 (0.77, 2.35)	1.43 (0.85, 2.42)	1.37 (0.79, 2.38)	1.34 (0.77, 2.35)	1.43 (0.85, 2.42)	1.37 (0.79, 2.38)	1.34 (0.77, 2.35)
Tertile 2	1.21 (0.80, 1.81)	1.22 (0.81, 1.83)	1.14 (0.75, 1.73)	1.06 (0.68, 1.64)	1.00 (0.64, 1.56)	0.99 (0.64, 1.55)	1.06 (0.68, 1.64)	1.00 (0.64, 1.56)	0.99 (0.64, 1.55)	1.06 (0.68, 1.64)	1.00 (0.64, 1.56)	0.99 (0.64, 1.55)
Tertile 3	1	1	1	1	1	1	1	1	1	1	1	1

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 10: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011) and BD-STEPS (2014-2018) (continued)

	Diaphragmatic Hernia (Physical Activity n=226 cases) (Sitting n=234 cases)						Gastroschisis (Physical Activity n=402 cases) (Sitting n=407 cases)					
	Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	1.24 (0.85, 1.81)		1.25 (0.86, 1.84)		1.25 (0.84, 1.86)		1.09 (0.83, 1.44)		1.07 (0.80, 1.44)		1.13 (0.83, 1.54)	
Tertile 3	1.28 (0.85, 1.92)		1.27 (0.84, 1.91)		1.24 (0.81, 1.90)		1.59 (1.20, 2.10)		1.44 (1.07, 1.95)		1.48 (1.08, 2.02)	
<u>Moderate activity in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.98 (0.67, 1.42)		0.97 (0.66, 1.42)		0.92 (0.62, 1.36)		1.04 (0.79, 1.36)		1.15 (0.86, 1.54)		1.17 (0.86, 1.58)	
Tertile 3	1.00 (0.69, 1.47)		0.99 (0.67, 1.46)		1.01 (0.68, 1.51)		1.22 (0.93, 1.61)		1.45 (1.08, 1.95)		1.45 (1.07, 1.96)	
<u>Vigorous activity in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.98 (0.67, 1.43)		0.99 (0.67, 1.47)		1.00 (0.67, 1.50)		0.84 (0.63, 1.12)		0.84 (0.62, 1.14)		0.83 (0.61, 1.15)	
Tertile 3	1.05 (0.72, 1.53)		1.03 (0.70, 1.51)		1.06 (0.72, 1.58)		1.32 (1.02, 1.71)		1.11 (0.84, 1.48)		1.11 (0.83, 1.48)	
<u>Total in minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	1.03 (0.70, 1.52)		1.02 (0.69, 1.52)		1.00 (0.66, 1.51)		1.36 (1.02, 1.82)		1.38 (1.01, 1.88)		1.39 (1.01, 1.90)	
Tertile 3	1.26 (0.87, 1.83)		1.23 (0.84, 1.80)		1.25 (0.85, 1.84)		1.68 (1.27, 2.21)		1.61 (1.19, 2.17)		1.61 (1.19, 2.20)	
<u>Total intensity-weighted activity in MET-minutes/week</u>												
Tertile 1	1		1		1		1		1		1	
Tertile 2	0.98 (0.66, 1.45)		0.99 (0.67, 1.48)		0.96 (0.63, 1.45)		1.15 (0.86, 1.53)		1.15 (0.85, 1.57)		1.13 (0.82, 1.55)	
Tertile 3	1.28 (0.89, 1.85)		1.24 (0.85, 1.80)		1.25 (0.85, 1.84)		1.56 (1.20, 2.05)		1.52 (1.13, 2.02)		1.51 (1.12, 2.03)	
<u>Sitting in hours/day</u>												
Tertile 1	0.72 (0.44, 1.19)		0.65 (0.39, 1.10)		0.71 (0.41, 1.21)		0.92 (0.65, 1.30)		0.81 (0.55, 1.17)		0.86 (0.58, 1.26)	
Tertile 2	1.10 (0.78, 1.54)		1.07 (0.76, 1.52)		1.06 (0.75, 1.52)		1.18 (0.92, 1.51)		1.08 (0.82, 1.41)		1.06 (0.80, 1.39)	
Tertile 3	1		1		1		1		1		1	

Abbreviations: BD-STEPS, Birth Defects Study To Evaluate Pregnancy exposureS; CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 11: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011)

	Anencephaly (Physical Activity n=102 cases) (Sitting n=102 cases)						Spina Bifida (Physical Activity n=331 cases) (Sitting n=338 cases)					
	Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>												
Tertile 1	1			1			1			1		
Tertile 2	2.04 (1.20, 3.48)			2.02 (1.18, 3.47)			1.96 (1.14, 3.38)			0.97 (0.66, 1.43)	1.06 (0.72, 1.57)	1.07 (0.71, 1.61)
Tertile 3	1.39 (0.74, 2.63)			1.30 (0.68, 2.48)			1.27 (0.66, 2.42)			0.77 (0.49, 1.23)	0.82 (0.51, 1.32)	0.81 (0.49, 1.33)
<u>Moderate activity in minutes/week</u>												
Tertile 1	1			1			1			1		
Tertile 2	1.29 (0.76, 2.17)			1.25 (0.73, 2.14)			1.20 (0.70, 2.05)			1.05 (0.73, 1.53)	1.08 (0.74, 1.57)	1.08 (0.73, 1.61)
Tertile 3	1.31 (0.75, 2.26)			1.26 (0.71, 2.21)			1.18 (0.67, 2.09)			0.47 (0.29, 0.78)	0.48 (0.29, 0.79)	0.49 (0.29, 0.83)
<u>Vigorous activity in minutes/week</u>												
Tertile 1	1			1			1			1		
Tertile 2	1.33 (0.77, 2.29)			1.37 (0.78, 2.42)			1.29 (0.73, 2.28)			1.10 (0.74, 1.64)	1.28 (0.85, 1.93)	1.23 (0.80, 1.89)
Tertile 3	1.39 (0.80, 2.40)			1.36 (0.77, 2.40)			1.30 (0.74, 2.31)			0.77 (0.50, 1.20)	0.83 (0.53, 1.31)	0.74 (0.46, 1.21)
<u>Total in minutes/week</u>												
Tertile 1	1			1			1			1		
Tertile 2	0.84 (0.49, 1.44)			0.87 (0.50, 1.50)			0.86 (0.50, 1.49)			0.82 (0.56, 1.20)	0.84 (0.56, 1.24)	0.85 (0.56, 1.28)
Tertile 3	1.24 (0.75, 2.06)			1.19 (0.71, 2.00)			1.13 (0.67, 1.91)			0.56 (0.36, 0.87)	0.57 (0.36, 0.89)	0.56 (0.35, 0.90)
<u>Total intensity-weighted activity in MET-minutes/week</u>												
Tertile 1	1			1			1			1		
Tertile 2	0.81 (0.47, 1.40)			0.81 (0.47, 1.42)			0.80 (0.46, 1.40)			0.96 (0.65, 1.42)	0.99 (0.67, 1.47)	0.97 (0.64, 1.46)
Tertile 3	1.27 (0.77, 2.10)			1.20 (0.72, 2.01)			1.14 (0.68, 1.92)			0.62 (0.39, 0.96)	0.63 (0.40, 0.99)	0.62 (0.38, 0.99)
<u>Sitting in hours/day</u>												
Tertile 1	0.81 (0.40, 1.62)			0.72 (0.34, 1.51)			0.79 (0.37, 1.66)			1.14 (0.68, 1.92)	0.97 (0.56, 1.68)	0.96 (0.53, 1.72)
Tertile 2	1.18 (0.71, 1.95)			1.19 (0.72, 1.97)			1.21 (0.73, 2.02)			1.26 (0.83, 1.90)	1.26 (0.84, 1.91)	1.31 (0.86, 2.02)
Tertile 3	1			1			1			1		1

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 11: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011) (continued)

		Anotia and Microtia (Physical Activity n=216 cases) (Sitting n=220 cases)						Cleft Palate (Physical Activity n=398 cases) (Sitting n=407 cases)					
		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.90 (0.51, 1.59)		1.04 (0.58, 1.84)		0.89 (0.48, 1.66)		0.89 (0.61, 1.30)		0.83 (0.56, 1.22)		0.83 (0.56, 1.23)	
Tertile	3	1.16 (0.63, 2.13)		1.21 (0.64, 2.26)		1.13 (0.59, 2.20)		1.08 (0.71, 1.63)		0.98 (0.64, 1.50)		1.00 (0.65, 1.54)	
<u>Moderate activity in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.84 (0.50, 1.40)		0.92 (0.54, 1.55)		0.93 (0.53, 1.62)		0.84 (0.58, 1.22)		0.77 (0.53, 1.13)		0.76 (0.51, 1.11)	
Tertile	3	0.29 (0.13, 0.64)		0.35 (0.16, 0.76)		0.29 (0.12, 0.71)		0.75 (0.49, 1.13)		0.67 (0.44, 1.02)		0.61 (0.40, 0.95)	
<u>Vigorous activity in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.83 (0.46, 1.49)		1.01 (0.55, 1.87)		1.13 (0.59, 2.19)		0.83 (0.56, 1.25)		0.74 (0.49, 1.13)		0.77 (0.50, 1.17)	
Tertile	3	1.00 (0.56, 1.78)		1.10 (0.61, 2.01)		1.14 (0.59, 2.21)		1.07 (0.72, 1.58)		0.95 (0.64, 1.42)		1.00 (0.67, 1.50)	
<u>Total in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	1.21 (0.70, 2.09)		1.36 (0.78, 2.38)		1.31 (0.72, 2.38)		1.01 (0.69, 1.48)		0.95 (0.64, 1.40)		0.94 (0.63, 1.39)	
Tertile	3	0.75 (0.39, 1.42)		0.79 (0.41, 1.53)		0.75 (0.37, 1.53)		0.91 (0.61, 1.37)		0.81 (0.54, 1.22)		0.79 (0.52, 1.20)	
<u>Total intensity-weighted activity in MET-minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	1.09 (0.63, 1.89)		1.26 (0.72, 2.21)		1.22 (0.67, 2.23)		0.93 (0.63, 1.37)		0.87 (0.59, 1.29)		0.85 (0.57, 1.26)	
Tertile	3	0.76 (0.41, 1.41)		0.81 (0.42, 1.54)		0.72 (0.36, 1.46)		0.94 (0.63, 1.41)		0.84 (0.56, 1.26)		0.83 (0.55, 1.25)	
<u>Sitting in hours/day</u>													
Tertile	1	1.90 (0.96, 3.77)		1.49 (0.73, 3.06)		1.51 (0.72, 3.16)		0.90 (0.57, 1.43)		1.03 (0.64, 1.67)		0.99 (0.60, 1.62)	
Tertile	2	1.19 (0.64, 2.21)		1.11 (0.59, 2.08)		0.91 (0.48, 1.75)		0.76 (0.52, 1.10)		0.77 (0.53, 1.11)		0.75 (0.51, 1.09)	
Tertile	3	1		1		1		1		1		1	

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 11: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011) (continued)

			Cleft Lip with or without Cleft Palate (Physical Activity n=778 cases) (Sitting n=801 cases)					Esophageal Atresia (Physical Activity n=221 cases) (Sitting n=228 cases)						
			Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>			1		1		1		1		1		1	
Tertile	2		0.94 (0.72, 1.24)		0.96 (0.73, 1.27)		0.96 (0.73, 1.27)		1.74 (0.86, 3.49)		1.73 (0.85, 3.49)		1.64 (0.81, 3.32)	
Tertile	3		0.92 (0.67, 1.26)		0.92 (0.67, 1.27)		0.87 (0.63, 1.20)		1.63 (0.74, 3.56)		1.64 (0.75, 3.60)		1.56 (0.71, 3.42)	
<u>Moderate activity in minutes/week</u>			1		1		1		1		1		1	
Tertile	2		0.96 (0.73, 1.27)		0.99 (0.74, 1.31)		0.95 (0.71, 1.27)		1.51 (0.73, 3.15)		1.49 (0.71, 3.11)		1.42 (0.67, 3.01)	
Tertile	3		0.92 (0.69, 1.25)		0.96 (0.71, 1.31)		0.94 (0.69, 1.28)		2.02 (0.98, 4.18)		1.91 (0.92, 4.00)		1.85 (0.89, 3.88)	
<u>Vigorous activity in minutes/week</u>			1		1		1		1		1		1	
Tertile	2		1.27 (0.95, 1.69)		1.28 (0.95, 1.72)		1.25 (0.93, 1.70)		0.78 (0.37, 1.66)		0.81 (0.37, 1.75)		0.84 (0.38, 1.83)	
Tertile	3		1.04 (0.76, 1.41)		1.02 (0.75, 1.40)		0.99 (0.72, 1.36)		1.53 (0.79, 2.96)		1.49 (0.76, 2.92)		1.52 (0.77, 3.02)	
<u>Total in minutes/week</u>			1		1		1		1		1		1	
Tertile	2		0.73 (0.54, 0.98)		0.75 (0.56, 1.01)		0.74 (0.55, 1.00)		0.86 (0.42, 1.76)		0.84 (0.41, 1.73)		0.76 (0.36, 1.60)	
Tertile	3		0.98 (0.74, 1.30)		0.99 (0.75, 1.32)		0.95 (0.71, 1.27)		1.37 (0.71, 2.65)		1.28 (0.66, 2.49)		1.22 (0.63, 2.37)	
<u>Total intensity-weighted activity in MET-minutes/week</u>			1		1		1		1		1		1	
Tertile	2		0.80 (0.60, 1.07)		0.83 (0.62, 1.12)		0.82 (0.61, 1.11)		0.86 (0.42, 1.77)		0.84 (0.41, 1.72)		0.87 (0.42, 1.81)	
Tertile	3		1.01 (0.76, 1.34)		1.02 (0.76, 1.36)		0.98 (0.73, 1.31)		1.36 (0.70, 2.63)		1.26 (0.65, 2.46)		1.28 (0.65, 2.52)	
<u>Sitting in hours/day</u>			1.27 (0.89, 1.80)		1.14 (0.79, 1.65)		1.11 (0.77, 1.62)		0.71 (0.26, 1.92)		0.75 (0.27, 2.07)		0.78 (0.28, 2.14)	
Tertile	2		1.22 (0.92, 1.62)		1.18 (0.89, 1.58)		1.16 (0.87, 1.55)		1.49 (0.77, 2.91)		1.57 (0.80, 3.06)		1.51 (0.77, 2.97)	
Tertile	3		1		1		1		1		1		1	

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 11: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011) (continued)

			Anorectal Atresia/Stenosis (noncomplex) (Physical Activity n=108 cases) (Sitting n=107 cases)					Hypospadias, second/third degree (Physical Activity n=516 cases) (Sitting n=521 cases)						
			Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>														
Tertile	1		1		1		1		1		1		1	
Tertile	2		0.97 (0.51, 1.85)		1.05 (0.55, 2.00)		1.00 (0.53, 1.92)		1.03 (0.79, 1.34)		0.93 (0.70, 1.23)		0.92 (0.69, 1.22)	
Tertile	3		1.63 (0.85, 3.10)		1.67 (0.87, 3.21)		1.57 (0.82, 3.03)		0.78 (0.57, 1.08)		0.69 (0.49, 0.96)		0.67 (0.48, 0.94)	
<u>Moderate activity in minutes/week</u>														
Tertile	1		1		1		1		1		1		1	
Tertile	2		1.22 (0.65, 2.29)		1.25 (0.66, 2.35)		1.15 (0.61, 2.19)		0.85 (0.65, 1.13)		0.75 (0.56, 1.00)		0.73 (0.55, 0.98)	
Tertile	3		1.28 (0.66, 2.47)		1.25 (0.64, 2.45)		1.20 (0.61, 2.34)		0.85 (0.64, 1.14)		0.72 (0.53, 0.98)		0.70 (0.51, 0.96)	
<u>Vigorous activity in minutes/week</u>														
Tertile	1		1		1		1		1		1		1	
Tertile	2		0.43 (0.22, 0.85)		0.50 (0.25, 1.00)		0.47 (0.24, 0.95)		1.00 (0.75, 1.33)		0.89 (0.66, 1.20)		0.84 (0.62, 1.14)	
Tertile	3		0.74 (0.41, 1.33)		0.80 (0.44, 1.47)		0.75 (0.41, 1.38)		0.89 (0.67, 1.20)		0.78 (0.57, 1.06)		0.73 (0.53, 0.99)	
<u>Total in minutes/week</u>														
Tertile	1		1		1		1		1		1		1	
Tertile	2		0.52 (0.25, 1.09)		0.54 (0.26, 1.13)		0.53 (0.25, 1.11)		0.74 (0.56, 0.98)		0.66 (0.49, 0.88)		0.65 (0.48, 0.87)	
Tertile	3		1.43 (0.80, 2.55)		1.43 (0.79, 2.57)		1.34 (0.75, 2.42)		0.74 (0.55, 0.99)		0.62 (0.46, 0.84)		0.60 (0.44, 0.82)	
<u>Total intensity-weighted activity in MET-minutes/week</u>														
Tertile	1		1		1		1		1		1		1	
Tertile	2		0.62 (0.31, 1.25)		0.65 (0.32, 1.32)		0.63 (0.31, 1.28)		0.82 (0.62, 1.09)		0.72 (0.54, 0.96)		0.71 (0.53, 0.95)	
Tertile	3		1.31 (0.73, 2.36)		1.29 (0.71, 2.35)		1.22 (0.67, 2.22)		0.79 (0.59, 1.06)		0.66 (0.49, 0.90)		0.64 (0.47, 0.87)	
<u>Sitting in hours/day</u>														
Tertile	1		0.59 (0.24, 1.43)		0.42 (0.16, 1.07)		0.45 (0.18, 1.16)		0.69 (0.49, 0.99)		0.87 (0.60, 1.26)		0.88 (0.60, 1.29)	
Tertile	2		1.05 (0.58, 1.90)		0.99 (0.54, 1.79)		1.01 (0.55, 1.84)		0.71 (0.55, 0.93)		0.74 (0.56, 0.97)		0.73 (0.55, 0.96)	
Tertile	3		1		1		1		1		1		1	

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 11: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011) (continued)

		Transverse Limb Deficiency (Physical Activity n=136 cases) (Sitting n=142 cases)						Craniosynostosis (Physical Activity n=325 cases) (Sitting n=331 cases)					
		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.64 (0.38, 1.08)		0.61 (0.36, 1.04)		0.64 (0.38, 1.09)		1.09 (0.82, 1.45)		1.03 (0.76, 1.37)		1.03 (0.76, 1.38)	
Tertile	3	0.44 (0.22, 0.87)		0.41 (0.21, 0.83)		0.38 (0.18, 0.78)		1.02 (0.73, 1.43)		1.01 (0.72, 1.41)		1.03 (0.73, 1.45)	
<u>Moderate activity in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.51 (0.28, 0.91)		0.49 (0.27, 0.89)		0.54 (0.30, 0.99)		1.08 (0.80, 1.46)		1.03 (0.76, 1.39)		0.98 (0.72, 1.34)	
Tertile	3	0.75 (0.43, 1.31)		0.75 (0.43, 1.33)		0.79 (0.44, 1.42)		1.14 (0.83, 1.56)		1.11 (0.80, 1.52)		1.07 (0.77, 1.48)	
<u>Vigorous activity in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.83 (0.48, 1.46)		0.76 (0.43, 1.36)		0.70 (0.39, 1.25)		1.16 (0.85, 1.58)		1.06 (0.77, 1.45)		1.00 (0.72, 1.38)	
Tertile	3	0.77 (0.43, 1.39)		0.71 (0.39, 1.30)		0.69 (0.38, 1.25)		1.13 (0.83, 1.55)		1.03 (0.75, 1.42)		1.02 (0.73, 1.41)	
<u>Total in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.32 (0.17, 0.62)		0.31 (0.16, 0.60)		0.32 (0.17, 0.63)		1.04 (0.77, 1.40)		0.98 (0.72, 1.33)		0.96 (0.70, 1.31)	
Tertile	3	0.66 (0.38, 1.13)		0.64 (0.37, 1.11)		0.61 (0.35, 1.07)		1.04 (0.77, 1.42)		1.01 (0.74, 1.39)		1.01 (0.73, 1.39)	
<u>Total intensity-weighted activity in MET-minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.48 (0.26, 0.88)		0.46 (0.25, 0.85)		0.48 (0.26, 0.89)		1.07 (0.79, 1.44)		1.00 (0.74, 1.35)		0.98 (0.72, 1.34)	
Tertile	3	0.73 (0.42, 1.26)		0.71 (0.41, 1.24)		0.68 (0.38, 1.21)		1.01 (0.74, 1.38)		0.98 (0.71, 1.34)		1.00 (0.72, 1.37)	
<u>Sitting in hours/day</u>													
Tertile	1	1.59 (0.81, 3.12)		1.60 (0.80, 3.20)		1.59 (0.78, 3.22)		0.77 (0.53, 1.12)		0.89 (0.60, 1.32)		0.92 (0.62, 1.38)	
Tertile	2	1.23 (0.69, 2.20)		1.22 (0.68, 2.18)		1.18 (0.66, 2.13)		0.92 (0.70, 1.22)		0.96 (0.72, 1.28)		0.97 (0.73, 1.30)	
Tertile	3	1		1		1		1		1		1	

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 11: Association of physical activity and sitting with isolated birth defects; NBDPS (2008-2011) (continued)

		Diaphragmatic Hernia (Physical Activity n=226 cases) (Sitting n=234 cases)						Gastroschisis (Physical Activity n=402 cases) (Sitting n=407 cases)					
		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)		Model 1 Unadjusted OR (95% CI)		Model 2 Adjusted* OR (95% CI)		Model 3 Adjusted** OR (95% CI)	
<u>Walking in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.66 (0.37, 1.16)		0.67 (0.38, 1.20)		0.63 (0.35, 1.13)		1.15 (0.80, 1.64)		1.14 (0.78, 1.67)		1.20 (0.81, 1.77)	
Tertile	3	0.90 (0.49, 1.64)		0.90 (0.49, 1.67)		0.77 (0.41, 1.46)		1.35 (0.91, 1.99)		1.26 (0.83, 1.90)		1.21 (0.78, 1.86)	
<u>Moderate activity in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.74 (0.41, 1.33)		0.76 (0.42, 1.37)		0.76 (0.41, 1.39)		0.98 (0.69, 1.41)		1.10 (0.75, 1.62)		1.15 (0.77, 1.71)	
Tertile	3	0.90 (0.50, 1.62)		0.92 (0.50, 1.68)		0.96 (0.52, 1.78)		1.10 (0.76, 1.60)		1.42 (0.95, 2.12)		1.40 (0.93, 2.12)	
<u>Vigorous activity in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	1.26 (0.70, 2.27)		1.19 (0.65, 2.18)		1.20 (0.65, 2.22)		0.92 (0.63, 1.34)		0.87 (0.58, 1.31)		0.88 (0.58, 1.34)	
Tertile	3	1.00 (0.53, 1.87)		0.96 (0.51, 1.83)		0.87 (0.45, 1.69)		1.21 (0.84, 1.74)		1.05 (0.71, 1.55)		1.05 (0.70, 1.57)	
<u>Total in minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.96 (0.54, 1.71)		0.98 (0.55, 1.77)		0.96 (0.53, 1.76)		1.25 (0.87, 1.81)		1.29 (0.87, 1.91)		1.24 (0.83, 1.86)	
Tertile	3	0.93 (0.51, 1.70)		0.93 (0.50, 1.72)		0.88 (0.47, 1.66)		1.27 (0.87, 1.84)		1.33 (0.89, 1.99)		1.28 (0.85, 1.93)	
<u>Total intensity-weighted activity in MET-minutes/week</u>													
Tertile	1	1		1		1		1		1		1	
Tertile	2	0.85 (0.47, 1.53)		0.87 (0.48, 1.57)		0.84 (0.45, 1.54)		1.15 (0.80, 1.67)		1.16 (0.78, 1.72)		1.13 (0.76, 1.70)	
Tertile	3	0.93 (0.52, 1.68)		0.93 (0.51, 1.70)		0.89 (0.48, 1.64)		1.25 (0.86, 1.81)		1.35 (0.91, 2.00)		1.30 (0.86, 1.95)	
<u>Sitting in hours/day</u>													
Tertile	1	0.50 (0.22, 1.12)		0.53 (0.23, 1.25)		0.59 (0.25, 1.38)		0.75 (0.47, 1.21)		0.71 (0.42, 1.18)		0.73 (0.43, 1.24)	
Tertile	2	0.87 (0.51, 1.47)		0.94 (0.55, 1.60)		0.89 (0.51, 1.54)		1.03 (0.73, 1.46)		0.98 (0.68, 1.43)		0.96 (0.65, 1.40)	
Tertile	3	1		1		1		1		1		1	

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index

eTable 12: Association of physical activity and sitting with gastroschisis stratified by age; NBDPS (2008-2011) and BD-STEPS (2014-2018)

	Gastroschisis					
	Maternal Age <20 years			Maternal Age ≥20 years		
	Physical Activity n=91 cases and n=149 controls			Physical Activity n=311 cases and n=2487 controls		
	Sitting n=92 cases and n=151 controls			Sitting n=315 cases and n=2517 controls		
	Unadjusted OR (95% CI)	Adjusted* OR (95% CI)	Adjusted** OR (95% CI)	Unadjusted OR (95% CI)	Adjusted* OR (95% CI)	Adjusted** OR (95% CI)
<u>Walking in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.45 (0.77, 2.73)	1.47 (0.77, 2.79)	1.64 (0.84, 3.19)	0.91 (0.67, 1.23)	0.93 (0.68, 1.28)	0.95 (0.68, 1.32)
Tertile 3	1.12 (0.55, 2.29)	1.07 (0.51, 2.24)	1.15 (0.54, 2.43)	1.61 (1.20, 2.16)	1.36 (0.99, 1.85)	1.34 (0.97, 1.86)
<u>Moderate activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.81 (0.44, 1.49)	0.72 (0.39, 1.36)	0.73 (0.38, 1.40)	1.28 (0.95, 1.73)	1.38 (1.00, 1.90)	1.37 (0.98, 1.90)
Tertile 3	1.31 (0.67, 2.55)	1.05 (0.52, 2.13)	1.05 (0.51, 2.14)	1.40 (1.03, 1.89)	1.48 (1.07, 2.04)	1.46 (1.05, 2.03)
<u>Vigorous activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.42 (0.72, 2.80)	1.36 (0.68, 2.73)	1.12 (0.55, 2.30)	0.82 (0.60, 1.12)	0.82 (0.59, 1.14)	0.85 (0.61, 1.20)
Tertile 3	0.87 (0.46, 1.62)	0.86 (0.45, 1.62)	0.81 (0.42, 1.56)	1.34 (1.01, 1.77)	1.15 (0.85, 1.56)	1.16 (0.85, 1.58)
<u>Total activity in minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	1.11 (0.59, 2.06)	1.09 (0.58, 2.06)	1.08 (0.56, 2.07)	1.28 (0.93, 1.76)	1.38 (0.99, 1.92)	1.38 (0.98, 1.95)
Tertile 3	1.10 (0.56, 2.15)	1.01 (0.51, 2.03)	1.03 (0.51, 2.10)	1.75 (1.30, 2.36)	1.54 (1.12, 2.11)	1.52 (1.10, 2.11)
<u>Total intensity-weighted activity in MET-minutes/week</u>						
Tertile 1	1	1	1	1	1	1
Tertile 2	0.93 (0.50, 1.74)	0.88 (0.46, 1.67)	0.90 (0.47, 1.73)	1.05 (0.77, 1.44)	1.15 (0.82, 1.61)	1.13 (0.80, 1.60)
Tertile 3	0.97 (0.50, 1.87)	0.90 (0.45, 1.77)	0.93 (0.46, 1.87)	1.64 (1.23, 2.18)	1.46 (1.08, 1.99)	1.44 (1.05, 1.98)

<u>Sitting in hours/day</u>						
Tertile 1	0.60 (0.26, 1.39)	0.65 (0.27, 1.53)	0.71 (0.29, 1.72)	0.97 (0.67, 1.40)	0.88 (0.59, 1.30)	0.90 (0.60, 1.35)
Tertile 2	1.48 (0.80, 2.76)	1.50 (0.79, 2.83)	1.62 (0.84, 3.11)	1.10 (0.84, 1.44)	1.00 (0.75, 1.33)	0.97 (0.72, 1.30)
Tertile 3	1	1	1	1	1	1

Abbreviations: CI, confidence interval; MET, metabolic equivalent; NBDPS, National Birth Defects Prevention Study; OR, odds ratio

*Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension

**Adjusted for center, maternal age at delivery, maternal race/ethnicity, maternal education, history of diabetes, history of hypertension, pre-pregnancy body mass index