SUPPLEMENTARY MATERIALS

Supplementary Table 1. Cancer outcomes and contributing ICD-10 codes.

Cancer site or type	ICD-10 code(s)
Leukemia	C91.0, C91.1, C91.6, C91.7, C91.9, C92.0, C92.1, C92.4, C92.5, C92.7, C92.9, C93.0, C93.1, C93.3, C93.7, C94.0, C94.2, C94.6, C94.7, C95.0, C95.7, C95.9
Lymphoma	C81.0, C81.1, C81.2, C81.4, C81.7, C81.9, C82.9, C83.3, C83.5, C83.6, C83.7, C83.9, C84.0, C84.5, C84.6, C85.1, C85.7, C85.9, C96.0, C96.1, C96.3, C96.5, C96.6, C96.9
Brain/CNS	C70.0, C70.9, C71.0, C71.1, C71.2, C71.3, C71.4, C71.5, C71.6, C71.7, C71.8, C71.9, C72.0, C72.3, C72.8, C72.9, C75.2, C75.3, C75.5
Neuroblastoma	C47.0, C47.1, C47.4, C47.6, C47.8, C47.9, C74.0, C74.1, C74.9
Retinoblastoma	C69.2, C69.3, C69.4, C69.6, C69.8, C69.9
Kidney	C64.9
Liver	C22.0, C22.2, C22.7, C22.9
Osteosarcoma	C30.0, C30.1, C31.0, C31.9, C40.0, C40.1, C40.2, C40.3, C40.9, C41.0, C41.1, C41.2, C41.3, C41.4, C41.9
Soft tissue sarcoma	C49.0, C49.1, C49.2, C49.3, C49.4, C49.5, C49.6, C49.8, C49.9, C51.9, C52.9, C53.9, C63.2, C67.9, C76.0, C76.1, C76.2, C76.3, C76.4, C76.5, C76.7
Reproductive organ	C56.9, C57.9, C62.1, C62.9, C80.9
Other or unclassified	C00.9, C02.1, C02.2, C03.1, C04.9, C05.1, C06.9, C07.9, C08.9, C09.0, C09.9, C10.9, C11.0, C11.9, C13.9, C18.1, C18.2, C18.4, C34.9, C43.0, C43.1, C43.2, C43.3, C43.4, C43.5, C43.6, C43.7, C43.9, C44.0, C44.3, C44.4, C44.5, C44.5, C44.5, C44.6, C44.7, C44.7, C44.9, C48.0, C48.2, C48.8, C73.9, C76.0, C76.0, C76.1, C76.2, C76.3, C76.4, C76.5, C20.9, C25.0, C25.8, C38.1, C38.3, C45.1, C46.7, C65.9, C77.0, C77.3, C77.4, C77.9, C78.0, C78.8, C79.2, C79.3, C86.6, C88.3, C88.4

Supplementary Table 2. Summary of phthalate-containing medications prescribed to the cohort.[a]

Medication	ATC code	CAP	DBP	DEP	HPMCP	PVAP	Phthalate-free
Bisacodyl	A06AB02		9	7	5	—	14
Budesonide	A07EA06	—	2	—	—	—	40
Clarithromycin	J01FA09	—	—	—	9	—	71
Combinations	B01AC30	—	—	—	2	—	11
Diclofenac	M01AB05	2	3	2	—	—	214
Diclofenac combi	M01AB55	2	—	2	—	—	23
Dipyridamole	B01AC07	—	—	—	3	—	21
Duloxetine	N06AX21	—	—	—	11	—	52
Erythromycin	J01FA01	—	—	16	16	—	44
Esomeprazole	A02BC05	—	—	5	—	—	185
Fluoxetine	N06AB03	—	—	2	—	—	79
Ibuprofen	M01AE01	—	—	13	—	—	163
Lithium	N05AN01	—	2	—	—	—	2
Mesalazine	A07EC02	—	6	—	—	—	101
Mianserin	N06AX03	—	—	14	—	—	50
Multienzymes	A09AA02	2	4	2	15	—	64
Mycophenolic acid	L04AA06	—	—	—	2	—	17
Naproxen	M01AE02	28	—	8	—	—	88
Pentoxyverine	R05DB05	2	—	—	—	—	2

Propantheline	A03AB05	3	—	—	—	—	3
Rabeprazole	A02BC04	—	—	—	7	—	9
Sulfasalazine	A07EC01	3	—	—	—	—	35
Theophylline	R03DA04	13	—	8	—	—	20
Valproic acid	N03AG01	21	—	—	—	9	85
Verapamil	C08DA01	—	—	13	—	—	85

[a]Cell frequencies are the number of unique drug products in each phthalate content category. Note that some phthalate-containing drug products were formulated with more than one type of phthalate. ATC: Anatomical therapeutic chemical classtification system; CAP: Cellulose acetate phthalate; DBP: Dibutyl phthalate; DEP: Diethyl phthalate; HPMCP: Hydroxypropyl methylcellulose phthalate; PVAP: Polyvinyl acetate phthalate.

Supplementary Table 3. Associations between childhood phthalate exposure and type-specific cancer incidence, before and after semi-Bayes adjustment.[a]

Cancer type	Analysis	HR (95% CI)
Leukemia - combined	Semi-Bayes	0.96 (0.64, 1.43)
	Original	0.85 (0.55, 1.30)
Leukemia - acute lymphocytic	Semi-Bayes	0.95 (0.61, 1.47)
	Original	0.81 (0.50, 1.32)
Leukemia - acute myeloid	Semi-Bayes	1.28 (0.72, 2.28)
	Original	1.22 (0.44, 3.37)
Lymphoma - combined	Semi-Bayes	1.87 (1.28, 2.75)
	Original	2.07 (1.36, 3.14)
Lymphoma - non-Hodgkin	Semi-Bayes	1.86 (1.14, 3.02)
	Original	2.29 (1.33, 3.92)
Lymphoma - Hodgkin	Semi-Bayes	1.62 (0.96, 2.73)
	Original	2.04 (1.01, 4.12)
Lymphoma - Burkitt	Semi-Bayes	1.27 (0.65, 2.46)
	Original	0.90 (0.12, 6.75)
Brain/CNS	Semi-Bayes	1.05 (0.62, 1.78)
	Original	0.84 (0.43, 1.65)
Neuroblastoma	Semi-Bayes	1.39 (0.76, 2.53)
	Original	1.57 (0.49, 5.04)
Retinoblastoma	Semi-Bayes	(Not estimable)
	Original	(Not estimable)
Kidney	Semi-Bayes	1.29 (0.71, 2.34)
	Original	1.17 (0.37, 3.72)
Liver	Semi-Bayes	1.31 (0.68, 2.52)
	Original	1.18 (0.16, 8.86)
Osteosarcoma	Semi-Bayes	2.10 (1.24, 3.55)
	Original	2.78 (1.63, 4.75)
Soft tissue sarcoma	Semi-Bayes	1.20 (0.67, 2.15)
	Original	0.98 (0.36, 2.69)
Reproductive organ	Semi-Bayes	1.16 (0.56, 2.40)
	Original	0.38 (0.05, 2.78)

Other	Semi-Bayes	1.10 (0.68, 1.78)
	Original	0.95 (0.52, 1.75)

[a]HR = hazard ratio; CI = confidence interval; CNS = central nervous system

Supplementary Figure 1. Comparison of associations between childhood phthalate exposure and type-specific cancer incidence under original and alternative exposure definitions. In the original analysis, exposure was defined as receiving at least one prescription fill with a phthalate-containing drug product. In the sensitivity analysis, exposure was defined as receiving at least two prescription fills with a phthalate-containing drug product. Subjects were classified as unexposed until meeting the respective exposure definition. Comparison is limited to the 13 type-specific cancers with estimable associations in both analyses. Error bars represent the 95% confidence intervals (CIs). CNS=central nervous system.