**Supplementary Table 2.** Data Extraction

| First Author & Publication Year | Study Design | Pregnant Women (Y/N) | Lactating Women (Y/N) | Children in First 1,000 Days (Y/N) | Population | Number of Participants | Country of Study | LMIC (Y/N) | Mollusk Mentioned | Crustacean mentioned | Indicators/ Biomarkers measured | Key Findings | Notes | Hypothesis/ Objective |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Alvarez-Pedrerol 2010 | Cohort study | Y | N | N | Pregnant women visiting the public health center of Sabadell  for an ultrasound during the first trimester. | 600 | Spain | N | All mollusks | All shellfish | Urinary iodine concentrations (UIC) | No statistical significance in UIC according to intake frequency of shellfish and mollusks  Median UIC with in all women (N=600):  Shellfish-<once/month: 98 µg/l  1-3 times/month: 107 µg/l  >3 times/month: 110 µg/l  Mollusks-<once/month: 102 µg/l  1-3 times/month: 101 µg/l  >3 times/month: 110 µg/l  Median UIC in all women, excluding those with iodine supplementation (N=547):  Shellfish-<once/month: 98 µg/l  1-3 times/month: 100 µg/l  >3 times/month: 110 µg/l  Mollusks-<once/month: 99 µg/l  1-3 times/month: 96 µg/l  >3 times/month: 109 µg/l |  | "The objectives of this study were to evaluate the current status of iodine nutrition based on WHO criteria and to assess the main sources of iodine in a population of pregnant women from an apparently iodine-sufficient area." |
| Amezcua-Prieto 2018 | Case-control study | Y | N | Y | Population included women who attended five  hospitals in Eastern Andalusia (Spain): the University of  Jaen Hospital (UJH), Ubeda Hospital, the University of  Granada Hospitals (two centres) (UGH) and Poniente  Hospital (PH). | 518 | Spain | N | All bivalves and cephalopods | All crustaceans | Small-for-gestational age (SGA) | Compared to those who never ate shellfish:  Intake of bivalves molluscs > once a week during pregnancy (a serving of 6 units ~ 100-150g) was protective against SGA (OR:0.25, 95%CI: 0.08-0.76).  Intake of cephalopods 1-3 times a month (a serving of 200g) was protective against SGA (OR:0.62, 95%CI: 0.44-0.87)  Statistically non-significant relationships between frequency of crustacean consumption and SGA (a serving of 4-5 units; 200 g) | A corregidum was published, but it doesn't affect results on shellfish categories | "The present study aimed to determine how the consumption of different types of seafood during pregnancy affected the risk of having an SGA newborn."  Talks about seafood as both a source of essential nutrients and of contaminants |
| Anh 2014 | Cohort study | N | Y | N | Mothers (1-month post-partum) from Da Nang Airbase | 140 | Vietnam | Y | N/A | Marine crab and shrimp | Dioxin concentrations in breast milk | Levels of TEQ-PCDF, three PCDD isomers, and six PCDF isomers in breast milk were higher among mothers who ate marine crab and shrimp compared to mothers who did not (note: effect sizes were small for fish-eating habits) | Breast milk was collected at 1 mo post-partum, but not clear on when dietary info was collected | "...in this study, we investigated the associations between dioxin levels in breast milk and relevant risk factors, including age, length of residency, drinking water and eating habits in mothers living in one of the dioxin hot spots in Da Nang to identify the determinants of exposure associated with increased levels of dioxins in the breast milk of mothers living in a dioxin-contaminated area in Vietnam." |
| Basu 2014 | Cohort study | Y | N | N | Pregnant women from Earl Life Exposures in Mexico to Environmental Toxicants (ELEMENT) birth cohorts | 348 pregnant women | Mexico | Y | All shellfish | All shellfish | Blood mercury levels | Shellfish consumption was significantly correlated with pre-natal blood mercury levels at the 2nd (Spearman correlation coefficient: 0.17; p<0.01) and 3rd trimesters (Spearman correlation coefficient: 0.17; p<0.01), but not the 1st trimester (Spearman correlation coefficient: 0.13; p>0.05). | Study also includes children, but ages are not specified. Additional biomarkers (eg. Hair mercury, cord blood) were measured. But only reported blood mercury since that is the only outcomes analyzed with shellfish consumption. | "Objectives: To characterize mercury levels in pregnant women, children, and commonly consumed seafood samples." |
| Bautista Nino 2015 | Cohort study | Y | N | N | Pregnant women enrolled in the Generation R study--Rotterdam, the Netherlands | 3,134 pregnant women | Netherlands | N | Mussels | Crab, lobster, shrimp | Plasma omega-3 and -6 fatty acids: docosahexaenoic acid (DHA); eicosapentaenoic acid (EPA); Alpha-Linolenic acid (ALA); Linolenic acid (LA); Arachidonic acid (AA)  Angiogenic factors: placental growth factor (PIGF); soluble Flt-1 (sFlt-1) | Association between increasing shellfish consumption and angiogenic factors were statistically non-significant in first and second trimesters and in cord blood (P for trend > 0.05 across all outcomes). Comparison groups: 0 g/week; 1-13 g/week; .14 g/week | No analysis for shellfish associations with FA. | "...we investigated the association of maternal fish consumption with the angiogenic factors PlGF and sFlt-1 measured in the first and second trimester, and in cord blood. In addition, we evaluated the association of maternal plasma fatty acids levels in second trimester with PlGF and sFlt-1 levels in the second trimester and in cord blood" |
| Bentzen 2014 | Cross-sectional study | Y | N | N | Pregnant  women living in Baja California Sur, Mexico | 114 pregnant women | Mexico | Y | All shellfish | All shellfish | Total Hg concentrations ([THg]) in hair segments  Hair carbon and nitrogen isotopes | N-15 isotope in hair varied significantly with shellfish consumption (F = 3.3, p = 0.03)  C-13 isotope did not vary significantly with shellfish consumption (F< 1.95, p> 0.13)  The model with shellfish consumption was the second best approximating model describing total hair mercury. However, this effect was statistically non-significant (F=0.67, p=0.58) |  | "...the goal of evaluating whether [THg] varied in relation to the trophic level of the mother’s diet and whether variation in C and N stable isotopes could be explained by reported frequency of consumption of fish and shellfish" |
| Brantsæter 2011 | Cohort study | Y | N | Y | Mother-infant dyads from the Norwegian Mother and Child Cohort study | 62,099 mother-infant dyads | Norway | N | Mussels | Shrimp and crab | Birth weight  Birth length  Head circumference | Shellfish consumption (g/day) was significantly associated with birth weight (β:0.72, 95% CI:0.10, 1.30), but not with birth length (β:0.01, 95% CI:-0.001,0.004) nor head circumference (β:0.01, 95% CI:-0.001, 0.003) |  | "The aim of the present study was to address the hypothesis that different seafood subtypes differentially influence pregnancy outcomes by examining how maternal seafood consumption, including intake of lean and fatty fish, shell-fish and fish liver, and supplementary marine n-3 fatty acids, was associated with infant birth weight, birth length and head circumference in a large cohort of pregnant Norwegian women." |
| Brantsæter 2017 | Cohort study | Y | N | N | Mothers from the Norwegian Mother and Child Cohort study | 67,007 mothers | Norway | N | Mussels | Shrimp and crab | Intake of long chain n-3 polyunsaturated fatty acids (LCn-3 PUFAs) | Mean intake of LCn-3PUFA from shellfish: 0.009 g/day; shellfish contributes to 2.2% of LCn-3PUFA intake in this population.  Shellfish consumption significantly associated with increasing seafood consumption (p<0.001, by One-way ANOVA) but not associated with LCn-3PUFA supplement use (p=0.405, by Chi-squared test) | Measured associations with pre-term birth for other fish categories but not for shellfish | "The aim of the present study was to examine associations of maternal seafood and LCn-3PUFA supplement intakes with the risk of preterm delivery. We hypothesized that higher intake of seafood is associated with lower risk of preterm delivery and that associations vary by seafood categories." |
| Cao 2011 | Cross-sectional study | Y | N | N | Pregnant women | 1,600 | China | N | Oysters, clams, snails, scallops | Shrimp, crab | Cord blood serum concentrations of different polychlorinated biphenyls (PCBs) and organochlorine pesticides (OCPs) | hexachlorobenzene (HCB):  Non-significant associations for shrimp (r: 0.038, p=0.2140); shellfish(oyster, clam, snail, scallop) [r:-0.051, p=0.075]; and crab (r:-0.007, p=0.8210) intake  beta-hexachlorocyclohexane  (β-HCH) :  Significant correlations for shrimp (r: 0.082, p=0.007) and shellfish(oyster, clam, snail, scallop) [r:0.146, p<0.0001] intake. Non-significant for crab intake (r:0.027, p=0.3700).  Shrimp intake significantly associated with cord blood β-HCH (β=0.076, p=0.041)  p,p′-dichlorodiphenyl dichloroethylene (p,p'-DDE):  Significant correlations for shrimp (r: 0.111, p<0.0001) and shellfish (oyster, clam, snail, scallop) [r:0.165, p<0.0001] intake. Non-significant for crab intake (r:0.041, p=0.169)  Intake of shellfish (oyster, clam, snail, scallop) significantly associated with cord blood p,p'-DDE (β=0.070, p=0.037) | Note: They have separate regressions for shrimp; shellfish (oyster, clam, snail, scallop); crab. Basically, their definition of "shellfish" is limited to mollusks. | "The purpose of the present study was to characterize OCP and PCB exposure levels among healthy pregnant women by determining their concentrations in umbilical cord blood serum, to examine the relationship between OCP and PCB levels, dietary habits and socio-demographic characteristics of this population." |
| Chen 2022 | Cohort study | Y | N | Y | Full-term neonates of Han Chinese ethnicity | 1,107 | China | N | N/A | Shrimp, crab | Cord blood IgE levels (cIgE)  IL4 and IL13 pathway genes (IL13rs1800925, rs20541, rs848, IL4 rs2243250, and STAT6 rs324011) | cIGE  Non-significant association between any consumption of shellfish and risk of elevated cIgE levels ( >=0.5 IU/ml) [aOR:0.85, CI: 0.61-1.17].  IL13rs1800925  Non-significant associations with prenatal shellfish intake for babies carrying the CC genotype (aOR: 0.76, CI: 0.52-1.13) or the CT/TT genotype (aOR: 0.91, CI:0.50-1.67)  IL13rs20541  Significant association with prenatal shellfish intake for babies carrying the GG genotype (aOR: 0.59, CI: 0.36-0.95). Non-significant association with prenatal shellfish intake for babies carrying the GA/AA genotype (aOR:1.09, CI: 0.69-1.72)  IL13rs848  Non-significant associations with prenatal shellfish intake for babies carrying the CC genotype (aOR: 0.71, CI: 0.43-1.17) or the CA/AA genotype (aOR: 0.90, CI:0.58-1.40)  STAT6 rs324011  Non-significant associations with prenatal shellfish intake for babies carrying the CC genotype (aOR: 0.96, CI: 0.61-1.49) or the CT/TT genotype (aOR: 0.63, CI:0.38-1.04)  IL4 rs2243250  Non-significant associations with prenatal shellfish intake for babies carrying the TT genotype (aOR: 0.84, CI: 0.56-1.26) or the TC/CC genotype (aOR: 0.70, CI:0.39-1.25) |  | "We aimed to explore if certain prenatal dietary sources of antioxidants and pro‑oxidants are associated with cIgE elevation and if they interact with IL4 and IL13 pathway genes." |
| Costa 2016 | Cohort study | Y | N | Y | Pregnant women in population-based cohort (INMA project) from Asturias and Valencia | 541 | Spain | N | Clams or mussels; and, squid and octopus | Crabs, shrimp, or lobster | Cord serum concentrations of polybrominated diphenyl ethers (PBDEs): BDE-47, -99, -153, and -209 | Concentrations of BDE-47, -99, -209 and their sum (ΣPBDEs)  increased by 13.6%(95% CI:0.0, 29.0%), 21.1%(2.3, 43.5%), 21.7%(0.4, 47.5%) and 11.5%(2.2, 21.7%), respectively, per interquartile range increment in daily intake of shellfish and cephalopods |  | "The present study aimed to look at predictors of cord serum concentrations of four PBDEs (BDE-47, -99, -153, and -209) and their sum (∑PBDEs) with a focus on dietary and household-level factors" |
| Duarte-Salles 2010 | Cohort study | Y | N | N | Pregnant women in third trimester from INMA –  INfancia y Medio Ambiente (Environment and Childhood)  Project cohort | 657 pregnant women | Spain | N | Clams, mussels, cockles, squid, cuttlefish | Shrimp, crab | Dietary intake of polycyclic aromatic hydrocarbons (PAH) and benzo(a)pyrene (BaP) | Shellfish ranked as one of the top 3 food group predictors (out of 24 food groups analyzed) of both BaP (β=1.157 ± 0.060; p<0.001) and Total PAH (β=27.037 ± 1.763; p<0.001) intake.  Non-smokers  Shellfish contributed to 9.7% of BaP intake (mean intake from shellfish=0.08 µg/g).  Shellfish contributed to 4.4% of total PAH intake (mean intake from shellfish=0.389 µg/g).  Passive smokers  Shellfish contributed to 10.3% of BaP intake (mean intake from shellfish=0.020 µg/g).  Shellfish contributed to 5.1% of total PAH intake (mean intake from shellfish=0.48 µg/g).  Active smokers  Shellfish contributed to 12.9% of BaP intake (mean intake from shellfish=0.026 µg/g).  Shellfish contributed to 6.2% of total PAH intake (mean intake from shellfish=0.635 µg/g). |  | "Objective: To estimate the dietary intake of total polycyclic aromatic hydrocarbons (PAH) and benzo(a)pyrene (BaP), and to characterize factors associated with higher intake during pregnancy" |
| Gao 2018 | Cross-sectional study | N | N | Y | Children ages 1-84 months | 14,202 children | China | N | All shellfish | All shellfish | Blood mercery concentrations  Child anthropometry | Significant association between frequency of shellfish consumption and blood mercury concentrations (p<0.0001, by ANOVA with post hoc analysis):  ≤1-3 times per month (arithmetical mean concentration = 1.39 ± 1.06 μg/L); > 1-3 times per month and < 1-3 times per week (arithmetical mean concentration = 1.57 ± 0.82 μg/L); ≥ 4-6 times per week (arithmetical mean concentration= 1.62 ± 1.52) μg/L)  Compared to children who consumed shellfish ≤1-3 times per month, the odds of having blood mercury concentrations above the median (1.23 μg/L) :  > 1-3 times per month and < 1-3 times per week (adjusted OR: 1.33, CI: 1.050-1.684); ≥ 4-6 times per week (adjusted OR: 1.356, CI: 0.983-1.869).  Significant linear association between shellfish consumption and:  Mercury concentration (μg/L) [β:0.14, CI: 0.08, 0.20, p<0.0001];  Height (cm) [β:4.08, CI: 3.12, 5.03, p<0.0001];  Weight (kg) [β:1.10, CI: 0.80, 1.40, p<0.0001];  BMI (β:-0.17, CI: -0.30,-0.05), p=0.007) | Included because majority of the cohort falls under first 1000 days. | "The aims of our study were to measure total blood mercury levels in children aged 0–6 years and to investigate the association between fish consumption and total blood mercury levels and the health effects of mercury on anthropometry in China. Our goal was to provide information for preventing mercury exposure and the adverse health effects of mercury." |
| Gaxiola-Robles 2014 | Cross-sectional study | N | Y | N | Lactating women (7-10 days post-partum) | 108 | Mexico | Y | All shellfish | All shellfish | Breast milk concentrations of mercery (Hg), arsenic (As), and selenium (Se)  Glutathione S-transferase (GST) activity in breast milk | Non-significant associations between frequency of shellfish intake and GST, U mg-1 protein; Total Hg; and Total Se (p> 0.05, by Kruskal-Wallis Test).  Significant association between Total As and frequency of shellfish consumption with  higher levels found in those who never ate  shellfish or ate it once a month (p=0.04 by Kruskal-Wallis Test) |  | "The goal of this study was to determine the concentrations of [Se], [Hg] and [As], and evaluate its effect on the activity of glutathione S-transferase (GST) measured in breast milk of women from Baja California Sur, Mexico" |
| Gaxiola-Robles 2014 | Cross-sectional study | N | Y | N | Lactating women (7-10 days post-partum) | 75 | Mexico | Y | All shellfish | All shellfish | Hair mercury concentrations | Frequency of seafood consumption did not significantly contribute to total mercury concentrations in hair:  The median total mercery concentration (ugg−1) in hair for those who never eat seafood was 1.3, and those who eat seafood two or more times a week was 1.7 (p = 0.24)  Seafood intake did not significantly affect total mercury concentrations in hair by number of pregnancy:  Seafood intake in the GI (first pregnancy) group did not significant affect total mercury concentrations, with a median THg for those who never eat seafood of 1.3 ugg−1 and those who eat seafood two or more times a week of 1.9 ugg−1 (p = 0.14)  Seafood intake in the GII (2 partum) group did not significant affect total mercury concentrations, with a median THg for those who never eat seafood of 0.8 ugg−1 and those who eat seafood two or more times a week of 1.6 ugg−1 (p = 0.54)  Seafood intake in the GIII (3 partum) group did not significant affect total mercury concentrations, with a median THg for those who never eat seafood of 2.3 ugg−1 and those who eat seafood once every two weeks of 1.8 ugg−1 (p = 0.38) | Author contacted about "seafood" category  Author responded saying when they asked about seafood consumption: 40 participants report eating shrimps, crabs or lobster and 12 report eating clams or scallops. | "The objective of the present study was to determine [THg] in hair segments of mothers living in Baja California Sur (BCS) and the potential relationship to age, parity, marine diet, and tobacco exposure" |
| Golding 2013 | Cross-sectional study | Y | N | N | Pregnant women in the Avon Longitudinal Study of Parents and  Children (ALSPAC) | 4,484 | United Kingdom | N | All shellfish | All shellfish | Whole blood mercury concentration during pregnancy | Significant linear association between any shellfish consumption and blood mercury levels: (Mercury levels untransformed--β=0.09, p=0.0070; Mercury levels with natural log transformation--β=0.036, p=0.0131).  Significant non-linear relationship between increasing shellfish consumption (portions per week) and blood mercury levels (Deviation p=0.0031) |  | "The primary goal of the present study is to evaluate the assumption that seafood consumption is a major contributor to maternal blood levels of mercury" |
| González 2019 | Cross-sectional study | Y | N | Y | Population from ENALIA surveys ((National Dietary Survey on the Child and Adolescent Population)/ ((National Food Survey on Adults, the Elderly and Pregnant  Women) conducted in Spain | 1,862 children (including ages 6 months – 9 years)  157 pregnant women | Spain | N | Cuttlefish, mussel, squid | N/A | Intake of Arsenic (AS), Cadmium (Cd), Mercury (Hg), Methylmercury (MeHg), Lead (Pb), Inorganic Arsenic (InAs) | Squid consumption contributed to 28% of Cd intake for infants and 38% of Cd intake for children. | No specific shellfish data for pregnant women reported. They are lumped together with all adults. | "…to analyse, in widely consumed foodstuffs, the concentrations of arsenic (As), cadmium (Cd), mercury (Hg) and lead (Pb), as well as those of inorganic As (InAs) and methylmercury (MeHg)" |
| Heppe 2011 | Cohort study | Y | N | Y | Pregnant women in the generation R study | 3,380 | Netherlands | N | Mussels | Crab, lobster, shrimp | Fetal growth characteristics at 2nd and 3rd trimesters (head circumference, femur length, estimated fetal weight)  Anthropometry at birth (head circumference, birth length, birth weight)  Neonatal complications (pre-term birth, low birth wight, SGA) | Statistically non-significant associations between maternal shellfish consumption (grams/week) and all growth/anthropometric measures at 2nd and 3rd trimesters and at birth. Maternal consumption of more than 14 g of shellfish per week was associated with negative change in birth weight (Difference=-41.7 cm, CI:-81.2, -2.2).  Statistically non-significant relations between maternal shellfish consumption (grams/week) and neonatal complications. |  | "We examined the associations of first-trimester maternal lean-fish, fatty-fish and shellfish consumption with fetal growth characteristics in the second and third trimesters and at birth and the risks of neonatal complications in a population-based prospective cohort study among 3380 mothers and their children" |
| Hua 2017 | Cohort study | N | N | Y | 12-month old children from the Prediction of Allergies in  Taiwanese Children (PATCH) study | 272 | Taiwan | N | All shellfish | All shellfish | Fecal secretory IgA (sIgA), fecal eosinophil cationic protein (ECP), and serum levels of total IgE and IgE specific to 20 foods (including shellfish), and IgE specific to 20 inhalant allergens | Non-introduction of shellfish by 12 months was not significantly associated with IgE sensitization (OR:1.17, CI: 0.67--2.04) nor with doctor-diagnosed atopic dermatitis (OR:1.06, CI:(0.49--2.29) |  | "In this study, we aimed to determine whether introducing various allergenic foods during infancy is associated with IgE sensitization at 12 months of age." |
| Ingelido 2007 | Cross-sectional study | N | Y | N | Mothers from Venice and Rome | 39 | Italy | N | Clams and cockles | N/A | Concentrations of PCBs and PBDEs in human milk | Increased consumption of shellfish was not associated with PCB and PBDE concentrations in milk:  PCB-28, -52, and –101 were found in the mollusks consumed (clams and cockles) but not in human milk |  | "The levels of selected polychlorinated biphenyls (PCBs) and polybrominated diphenyl ethers (PBDEs) were measured in human milk samples from the areas of Venice and Rome, primarily in order to characterize the current levels of infant exposure to PCBs and PBDEs due to breast feeding in Italy." |
| Jain 2017 | Cross-sectional study | N | N | Y | Population-based sample from NHANES, including children ages 1-5 | 4,265 | USA | N | All shellfish | All shellfish | Total blood mercury (urine inorganic mercury was measured for other age groups in addition to blood mercury) | Children (ages 1-5) who ate any shellfish in the past 30 days had significantly higher adjusted geometric means of total blood mercury compared to those who reported consuming no shellfish (0.41 vs. 0.32 ng/mL, p< 0.01) |  | "to (i) study adjusted and unadjusted trends in the levels of urinary inorganic mercury (UIHG) and total blood mercury (TBHG) and (ii) factors that affect the observed levels of UIHG and TBHG among children aged 1–5 (CHLD15) and 6–11 (CHLD611) years, adolescents aged 12–19 years (ADOL), adults aged 20–64 years (ADLT), and senior citizens aged > = 65 years (SNR)." |
| Julvez 2020 | Cohort study | Y | N | N | Mother-child dyads from the prospective  INMA (INfancia y Medio Ambiente) cohort study | 1,644 | Spain | N | Clams, mussels, oysters, squid, octopus, cuttlefish | Shrimp, prawns, lobster, crab | Single nucleotide polymorphisms (SNPs) related with polyunsaturated fatty acid (PUFA) metabolism: rs1260326; rs2281591; rs174546; rs36016715; rs3741298; rs1077835; rs143988316  Cord blood concentrations of DHA and EPA  Child cognitive function/attention at age 8: Attention Network Test [ANT] omission errors, hit reactions time standard error (HRT-SE), parent-reported ADHD | Maternal shellfish intake during first pregnancy trimester was significantly correlated with (p<0.05):  Maternal total seafood intake during first pregnancy trimester (r=0.31);  Maternal large fatty fish intake during first pregnancy trimester (r=0.15);  Maternal small fatty fish intake during first pregnancy trimester (r=0.17);  Maternal lean fish intake during first pregnancy trimester (r=0.08);  Maternal canned tuna intake during first pregnancy trimester (r=0.10);  Child total fish intake at 5 years old (r=0.11);  Maternal total seafood intake during third pregnancy trimester (r=0.16)  Increasing maternal shellfish intake during first trimester was not significantly associated with reduced incidence of ANT omission errors (reduced incidence in errors indicate better attention) nor ADHD.  Maternal shellfish intake during first pregnancy trimester was significantly correlated with cord blood EPA concentrations (r=0.08, p<0.05) but not with cord blood DHA concentrations (r=0.02, p>0.05). |  | "In this analysis, we gained sufficient longitudinal data to formally test whether there is a direct association between pregnancy seafood consumption and 8-year-old attention, independent of child seafood consumption (5 years) and child cognitive status (1 and 5 years) collected in previous follow-ups of the cohort" |
| Le Donne 2016 | Cross-sectional study | Y | N | Y | Caucasian, non-immigrant women at 34 weeks of gestation | 114 | Italy | N | Shellfish with low DHA and mercury content | Shellfish with low DHA and mercury content | Neonatal: weight, length, and head circumference  Gestational: preterm birth, gestational diabetes mellitus, pregnancy induced hypertension, gestational duration | Shellfish consumption was significantly and negatively associated with neonatal head circumference (r=-0.165, P=0.079)and neonatal weight (r=-0.192, P=0.051). No significant correlation between Shellfish consumption and gestational duration nor neonatal length (P>0.10).  No statistical difference (P.0.10) in the frequency of gestational outcomes (preterm birth, pregnancy induced hypertension, gestational diabetes mellitus) between shellfish consumers and consumers of other fish types (A-large size oily fish with  both high DHA and mercury content [tuna, swordfish]; B-small  size oily fish with high DHA, low mercury content [mackerel, salmon, anchovy, garfish, spatula, sardine]; C- lean fish with low  DHA and medium mercury content [sea gilt-head bream, sea bass, cod, sea bream, perch] | Note, "significance" in this study includes "borderline significance" (P=0.10-0.05) | "The hypothesis that fish oil might be protective against pregnancy induced hypertension (PIH) dates back to the 1990s, when LCPUFA were reported to increase vasodilation and decrease platelet aggregation, though subsequent data were conflicting. Furthermore there is still uncertainty regarding the efficacy of increased intake of n-3LCPUFA during pregnancy in reducing the risk of gestational diabetes mellitus (GDM) and preeclampsia (pregnancy induced hypertension and proteinuria) (PE).....Considering the lack of studies in our geographical area, we aimed at evaluating fish and DHA supplements consumption in a North-Eastern Sicilian pregnant cohort. We also aimed at assessing the influence of fish consumption and DHA supplementation on gestational duration, preterm birth, PIH, GDM, neonatal weight, length and head circumference" |
| Leermakers 2013 | Cohort study | Y | N | Y | Pregnant women enrolled in the Generation R study--Rotterdam, the Netherlands (first trimester); children followed for first four years of life | 2,796 | Netherlands | N | Mussels | Crab, lobster, shrimp | Risk of wheezing and eczema | Shellfish consumption of 1–13 g per week during pregnancy was associated with an overall increased risk of child wheezing (aOR 1.20, 95% CI: 1.04, 1.40). There were however no significant longitudinal associations at ages 1 to 4.  Shellfish consumption of 1-13 g per week during pregnancy was associated with an overall increased risk of eczema (aOR 1.18, 95% CI: 1.01, 1.37). There were however no significant longitudinal associations at ages 1 to 4. |  | "Maternal fish consumption during pregnancy might influence the fetal immune system through anti-inflammatory effects of omega-3 fatty acids, and might affect the risks of childhood asthma and atopy. In Generation R,a prospective cohort study in the Netherlands, we examined the associations of first trimester fish consumption with childhood wheezing and eczema in the first 4 years of life." |
| Manzano-Salgado 2016 | Cohort study | Y | N | N | Pregnant women in the INMA (Infancia y Medio Ambiente, Environment and Childhood) birth cohort study | 1,216 | Spain | N | All shellfish | All shellfish | Llasma concentrations of perfluorobutane sulfonate (PFBS), perfluorohexansulfonic acid (PFHxS), perfluorooctantsulfonic acid (PFOS), perfluorooctanoic acid (PFOA) and perfluorononanoic (PFNA) | Compared to the lowest intake group (0.00-0.49 servings/week), high shellfish intake (≥0.80 servings/week) was associated with a 7% higher PFOA concentration, 2% higher PFHxS concentration, 2% higher PFOS concentration, and 4% higher PFNA concentration |  | "Prenatal exposure to perfluoroalkyl substances (PFAS) might affect child health; but maternal determinants of PFAS exposure are unclear. We evaluated the socio-demographic and dietary factors of prenatal PFAS concentrations in a Spanish birth cohort." |
| Maslova 2019 | Cohort study | Y | N | N | Pregnant women in Project Viva prospective pre-birth cohort study | 1,356 | USA | N | All shellfish | All shellfish | Allergic sensitization, atopic dermatitis, and asthma/wheeze | Multivariable associations of maternal shellfish intake (mean of 1st and 2nd trimester) with allergy biomarkers in early childhood:  Q1: adjusted OR: 1.0 (ref)  Q2: 1.06 (0.68,1.67)  Q3: 0.99 (0.64,1.53)  Q4: 1.55 (0.96,2.50)  Multivariable associations of maternal shellfish intake (mean of 1st and 2nd trimester) with allergy biomarkers in mid-childhood childhood:  Q1: adjusted OR: 1.0 (ref)  Q2: 0.90 (0.55,1.47)  Q3: 0.96 (0.60,1.52)  Q4: 1.64 (0.95,2.76) | Results in supplementary table 4 | "In Project Viva, an observational cohort followed from early pregnancy, we evaluated associations of maternal fish consumption as well as prenatal and cord blood n-3 and n-6 fatty acid (FA) levels with allergic sensitization, eczema/atopic dermatitis, wheeze and asthma in early childhood (median 3.3 years) as well as by mid-childhood (median 7.7 years). Because some n-6 as well as many n-3 FAs have anti-inflammatory properties, we hypothesized that specific n-6 as well as n-3 FAs might protect against sensitization and wheeze in children observed by mid-childhood." |
| Melero 2021 | Cohort study | Y | N | N | Pregnant women in the Hopital Clínico San Carlos-based cohort screened for gestational diabetes mellitues from January 2015 - December 2017 | 2,523 | Spain | N | All shellfish | All shellfish | Iodine intake | The probability of meeting the recommended daily iodine intake (150μg/day) was positively associated with the consumption of ≥1 weekly serving of shellfish (OR: 8.72; 95% CI: 6.96-10.93) |  | "The primary objective of this study is to evaluate the average pre-gestational food-based iodine consumption in pregnant women studied at the onset of gestation. The results would permit knowing the number of women reaching the recommended pre-gestational daily iodine intake of 150 ofμg with foods alone. The first secondary objective is to determine the eating pattern(s) associated with achieving the aforementioned daily food-based iodine consumption. The second one is to assess whether there is an association between not attaining said food-based iodine intake and the development of adverse materno-fetal outcomes." |
| Mendez 2007 | Cohort study | Y | N | Y | Pregnant women and their children in the INMA (Infancia y Medio Ambiente, Environment and Childhood) birth cohort study | 592 infant-mother dyads | Spain | N | “Other shellfish” category: bivalves (clams, mussels, oysters) and mollusks (squid, octopus, cuttlefish) | Shrimp, prawns, lobster or crab | SGA and birthweight | Higher intake of crustaceans (≥1 serving/week) was associated with increased SGA (p<0.05)  The intake of 'other shellfish' was not associated with SGA  Mean birthweight was 115g less among women who reported higher crustacean intake (p=0.007) and 91g less among women reported higher 'other shellfish' intake (p=0.009)  Intake of crustaceans >1/week was associated with SGA (OR=2.56; 95% CI: 1.11-5.89) after adjusted for child sex, maternal age, nulliparity, paternal BMI, education, energy intakes, under-reporting and smoking during pregnancy and contaminants  For intake of 'other shellfish': OR=0.93; 95% CI: 0.43-2.00 after adjustment |  | "Studies on maternal seafood consumption during pregnancy and the risk of small for gestational age (SGA) births have yielded inconsistent results. As few studies have examined associations with specific seafood subtypes or accounted simultaneously for exposure to persistent organic pollutants (POPs), it is uncertain to what extent intakes of seafood subtypes with variable contaminant or fatty acid content may explain these inconsistencies. ... This study examines the relationship between maternal seafood consumption during pregnancy and SGA birth in a cohort from the Mediterranean coast of Spain. ... Using measures in maternal serum, we also examine whether associations between seafood intakes and fetal growth are confounded by levels of several pollutants, including PCBs, DDE and other compounds previously studied in relation to fetal growth, with mixed results." |
| Miyashita 2015 | Cohort study | Y | Y | N | Pregnant women enrolled from the Hokkaido Study on Environment and Children's Health in Japan; blood sampling done during pregnancy (23-35 weeks gestation), but FFQ and mercury levels in hair measured within five days of maternal delivery | 367 mother-newborn pairs | Japan | N | Cuttlefish, octopus | Crab, shrimp | Hair mercury levels and total PCBs in blood | Shellfish consumption was not significantly associated with total PCBs (Spearman's rank correlation coefficient: 0.087; p>0.05) and hair mercury level (Spearman's rank correlation coefficient: 0.084; p>0.05) |  | "the aim of this study is to assess the effects of prenatal exposure to PCBs and MeHg on newborn anthropometric measurements, as well as the incidence of babies born small for gestational age (SGA),taking into account the biomarker of LCPUFAs among Japanese pregnant women." |
| Mohanty 2015 | Cohort study | Y | N | Y | Pregnant women in the Omega study attending prenatal care clinics associated with the Swedish Medical Centers and Tacoma General Hospital in Seattle and Tacoma, WA, USA, respectively and their newborns | 3,279 | USA | N | Clams, mussels, oysters, scallops, abalone, octopus and squid | Crab, lobster, shrimp or prawns | Risk of pregnancy complications: pre-eclampsia, gestational hypertension, gestational diabetes, preterm birth | No evidence for association between higher shellfish intake (>1 servings/week) and measured pregnancy complications  Wald P values for association between shellfish intake and: pre-eclampsia: 0.65 ; gestational hypertension: 0.97 ; gestational diabetes: 0.47 ; and, preterm birth: 0.67 |  | "We investigated associations of periconceptional seafood intake and risk of PE, GH, GDM and PTB. We hypothesized that higher intake of seafood is associated with a lower risk of these pregnancy complications and that associations vary by seafood subtype." |
| Mohanty 2015 | Cohort study | Y | N | Y | Pregnant women in the Omega study attending prenatal care clinics associated with the Swedish Medical Centers and Tacoma General Hospital in Seattle and Tacoma, WA, USA, respectively and their newborns | 3,141 | USA | N | Clams, mussels, oysters, scallops, abalone, octopus and squid | Crab, lobster, shrimp or prawns | Fetal growth indices: infant birthweight, birth length, head circumference, and ponderal index | Shellfish intake was not associated with risk of low birthweight, birth length or head circumference  High intake of shellfish (>1 servings/week) vs. low intake (<0.2 servings/month) was associated with a 0.6kg/m3 higher ponderal index (95% CI 0.0, 1.2kg/m3), linear trend P-value = 0.07  Among female infants, high shellfish intake (>1 servings/week of shellfish) vs. low intake (<0.2 servings/month) was associated with a 1.1kg/m3 higher mean ponderal index (95% CI 0.3, 1.9kg/m3) (linear trend P-value = 0.02)  Among male infants, the corresponding mean ponderal index was 0.2kg/m3 higher (95% CI -0.7, 1.2kg/m3) (linear trend P-value = 0.66) |  | "We investigated associations of maternal periconceptional seafood intake with fetal growth indices: birthweight, birth length, ponderal index, and head circumference. We hypothesised that associations of seafood intake and fetal growth vary by seafood subtype." |
| Moonesinghe 2016 | Cohort study | Y | N | N | Pregnant women in the Food Allergy and Intolerance Research (FAIR) study and their newborns | 969 | England | N | All shellfish | All shellfish | Risk of atopy and allergic disease at 3 years of age and 10 years of age | Maternal consumption of shellfish was not found to be associated with sensitization or allergic disease during childhood  Moderate or frequent consumption of shellfish and atopy at 3 years (OR = 1.096; 95% CI: 0.673-1.786), atopy at 10 years (OR = .915; 95% CI: 0.623-1.346), allergic disease at 3 years (OR = .990; 95% CI: 0.754-1.299), and, allergic disease at 10 years (OR = .996; 95% CI: 0.751-1.322) |  | "In this study, we aimed to investigate whether maternal diet, specifically seafood intake during pregnancy, is associated with the infant’s allergic outcomes in a well-characterized birth cohort with allergy at 3 and 10 years of age." |
| Osorio Yanez 2018 | Cohort study | Y | N | N | Pregnant women in the Omega study attending prenatal care clinics associated with the Swedish Medical Centers and Tacoma General Hospital in Seattle and Tacoma, WA, USA, respectively | 558 | USA | N | Oyster | Shrimp | Urinary cadmium, arsenic, and molybdenum | Urinary cadmium: no observed association between urinary cadmium levels and shellfish consumption (p = 0.970)  Urinrary arsenic: shellfish consumption was significantly associated with higher urinary arsenic levels (p < 0.001)  Urinary molybdenum: no observed association between urinary molybdenum levels and shellfish consumption (p = 0.515) |  | "Pregnancy is a period when the mother and her offspring are susceptible to the toxic effects of metals. We investigated associations of intake of frequently consumed foods with urinary metals concentrations among pregnant women in the Pacific Northwest." |
| Pele 2013 | Cohort study | Y | N | Y | Pregnant women and their children in the PELAGIE cohort study | 1,500 | France | N | All mollusks | All crustaceans | Probable wheeze, certain wheeze, eczema, and food allergy | Maternal shellfish intake during pregnancy once a month of more was associated with a higher risk of a food allergy at 2 years of age (aOR = 1.62; 95% CI: 1.11-2.36), but not probably wheeze (aOR = 1.08; 95% CI: 0.83-1.40), certain wheeze (aOR = 1.08; 95% CI: 0.78-1.49), or eczema (aOR = 1.09; 95% CI: 0.85-1.40) |  | "Environmental exposures, including dietary contaminants, may influence the developing immune system. This study assesses the association between maternal pre-parturition consumption of seafood and wheeze, eczema, and food allergy in preschool children. Fish and shellfish were studied separately as they differ accordin gto their levels of omega-3 polyunsaturated fatty acids (which have anti-allergic properties) and their levels of contaminants." |
| Refaat 2020 | Cross-sectional study | Y | N | N | Pregnant women attending the antenatal care unit of the Medical Centre of Umm Al-Qura University | 810 | Saudi Arabia | N | All shellfish | All shellfish | Serum concentrations of thyroid hormones, urine creatinine concentrations, and urine iodine concentrations | Shellfish consumption was significantly positively associated with urine iodine concentrations (OR = 4.989; 95% CI: 2.114-7.865) (p = 0.001)  Shellfish consumption was significantly negatively associated with isolated hypothyroxinemia (OR = 0.496; 95% CI: 0.056-0.819) (p = 0.02) and hyperthyroidism (OR = 0.323; 95% CI: 0.097-0.978) (p = 0.04), but not associated with subclinical hypothyroidism (OR = 1.141; 95% CI: 0.843-1.544) (p = NS) or overt hypothyroidism (OR = 1.165 95% CI: 0.716-1.895) (p = NS) |  | "This study, therefore, was designed to measure the rates of thyroid dysfunctions alongside iodine status in apparently healthy pregnant Saudi women during each trimester. Moreover, dietary habits and socioeconomic characteristics were collected to determine factors that could contribute to iodine deficiency and GTDs." |
| Saoudi 2018 | Cohort study | Y | N | N | Mother-infant pairs participating in the biological collection of the Elfe cohort (the French Longitudinal Study since Childhood) | 1,673 mother-infant pairs | France | N | All shellfish | All shellfish | Cord blood lead levels (CBLL) | Compared to mothers who did not each shellfish during the last 3 months of pregnancy, CBLL were lower in mothers who did (low precision of the estimate)  Compared to women who never consumed shellfish in the last three months of pregnancy, CBLL were 9.4% (95% CI: 0.5-19.6) among women who consumed less than 1 serving per month, 8.3% (95% CI: 1.4-15.8) among women who consumed 1-2 servings per month, and 6.8% (95% CI: -7.6-22.5) among women who consumed 1 serving per week or more |  | "The main objective of the perinatal component of the French human biomonitoring (HBM) program was to describe internal concentrations of environmental contaminants among mother-infant pairs, including cord blood lead levels (CBLL). An additional objective was: to identify and quantify the determinants of exposure. This paper describes the distribution of CBLL among French mother-baby pairs and their children and quantifies the influence of known risk factors of lead exposure." |
| Soler-Blasco 2021 | Cross-sectional study | Y | N | N | Pregnant women participating in the INMA (Environment and Childhood) Project | 1,017 | Spain | N | All shellfish and mollusks | All shellfish and mollusks | Maternal urinary As, arsenobetaine and As metabolites concentrations | Consumption of shellfish and mollusks was positively associated with TAs (total arsenic), AB (monomethylarsonic), ΣAs (sum of iAs, DMA, and MMA), DMA (dimethylarsinic) and iAs (inorganic Arsenic) concentrations  Consumption of 100g of shellfish and molluscs: associated with a 146% increase in urinary iAs concentrations (CI95%: 38,341%)" | Supplementary Figure S4 includes figure with fish subcategorized; author contacted for raw data, so we could have the exact percentages of the other arsenic categories, but email address was no longer in use | "Objectives: To describe the urinary concentrations of the different As species and evaluate the methylation efficiency during pregnancy, as well as their associated factors in a birth cohort of pregnant Spanish women" |
| Tham 2018 | Cohort study | N | N | Y | Infants in the GUSTO (Growing Up in Singapore Towards healthy Outcomes) cohort | 922 at 6 months  902 at 12 months  769 at 18 months  881 at 24 months  855 at 36 months  851 at 48 months | Singapore | N | All shellfish | All shellfish | Food allergy at age 12, 18, 24, 36, and 48 months | Shellfish allergy prevalence at 12 months: 0.2% (out of 902)  at 18 months: 0.6% (out of f 769)  at 24 months: 0.2% (out of 881)  at 36 months: 0.6% (5 of 855)  at 48 months: 0.9% (8 of 851)  No significant associations between the timing of shellfish introduction and the development of shellfish allergy at later time points |  | "In this study, we sought to explore the associations between the timing of allergenic food introduction and the development of food allergy in the Growing Up in Singapore Towards healthy Outcomes (GUSTO) birth cohort" |
| Vecchione 2021 | Cohort study | Y | N | N | Mothers and children in the Early Austism Risk Longitudinal Investigation (EARLI) and the Health Outcomes and Measures of the Environment (HOME) | 426 (156 from EARLI and 270 from HOME) | USA | N | Clams and oysters | Shrimp, lobster, crab | ASD-related traits using the Social Responsiveness Scale (SRS), but a different version of the SRS form using in EARLI and HOME (EARLI used the preschool version and HOME used the school-aged form)  Cognitive abilities were assessed using two different clinical assessment measures in the two cohorts: the Mullen Scales of Early Learning (MSEL) in EARLI and the Bayley Scales of Infant Development in HOME | Adjusted association between maternal shellfish intake during pregnancy and child raw total SRS scores:  early pregnancy intake: estimated ß = 0.75; 95% CI (-3.61, 5.11)  late pregnancy intake: 4.50 (-1.02, 10.02)  total pregnancy intake: 2.04 (-0.56, 8.67)  Adjusted association between maternal shellfish intake during pregnancy and MSEL scores (EARLI participants only):  early pregnancy intake: -1.68 (-8.25, 4.90)  late pregnancy intake: 0.73 (-8.50, 9.96)  total pregnancy intake: -2.88 (-9.48, 3.72)  Adjusted association between maternal shellfish intake during pregnancy and child Bayley MDI scores (HOME participants only):  early pregnancy intake: 2.32 (-1.01, 5.66)  late pregnancy intake: 0.63 (-3.31, 4.56)  total pregnancy intake: 1.47 (-2.02, 4.96) |  | "there is conflicting and limited literature examining prenatal fish intake in association with ASD-related outcomes, and information on potential effects of timing of fish intake during pregnancy is lacking. Given these gaps, we sought to examine the association between frequency and type of maternal fish intake during pregnancy and child ASD traits and cognitive development scores. Given evidence that uptake of PUFAs in the developing brain is most rapid in the third trimester (Haggarty 2010), and that critical windows have been suggested for other dietary factors in association with ASD, we also sought to examine associations during different time periods in pregnancy" |
| Vollset 2018 | Cohort study | N | Y | N | Mothers in the HUMIS (Norwegian Human Milk Study) study | 300 | Norway | N | Mussels and scallops | Crab and shrimp | Concentrations of mercury and cadmium in breast milk | Median Hg concentrations and crab intake:  never: 0.19 µg/kg  less than monthly: 0.20 µg/kg  monthly or more often: 0.24 µg/kg  Median Hg concentrations and shrimp intake:  never: 0.13 µg/kg  >10 meals per year: 0.19 µg/kg  >10 meals per year: 0.26 µg/kg (p≤0.001)  Median Hg concentrations and mussels and scallops intake:  never: 0.19 µg/kg  less than monthly: 0.22 µg/kg  monthly or more often: 0.38 µg/kg (p≤0.001)  Median Hg concentrations and lifetime consumption of crab:  never: 0.18 µg/kg  1-10 times: 0.19 µg/kg  11-100 times: 0.21 µg/kg  >100 times: 0.26 µg/kg (p≤0.05)  Median Cd concentrations and crab intake:  never: 0.058 µg/kg  less than monthly: 0.057 µg/kg  monthly or more often: 0.045 µg/kg  Median Cd concentrations and shrimp intake:  never: 0.06 µg/kg  >10 meals per year: 0.054 µg/kg  >10 meals per year: 0.058 µg/kg (p≤0.001)  Median Cd concentrations and mussels and scallops intake:  never: 0.058 µg/kg  less than monthly: 0.056 µg/kg  monthly or more often: 0.042 µg/kg (p≤0.001)  Median Cd concentrations and lifetime consumption of crab:  never: 0.062 µg/kg (p≤0.05)  1-10 times: 0.045 µg/kg  11-100 times: 0.062 µg/kg  >100 times: 0.062 µg/kg |  | "Infants are especially sensitive to exposure to toxic elements, due to their immature kidneys and liver, rapid growth, and development of their nervous system during this period (Goudarzi et al., 2013). Since infants may be exposed to toxic elements through breastfeeding, we determined the total concentration of Hg, Cd, and Pb in breast milk from Norwegian mothers and investigated factors that may affect the concentration of these elements in the breast milk." |
| Wang H.T. 2019 | Cross-sectional study | N | N | Y | Children participating in a survey administered to a nationally representative sample of US households | 38,408 children aged 0-18 (16.1% are aged 0-2) | USA | N | All shellfish and mollusks | All shellfish and crustaceans | Shellfish allergy (including mollusks and crustaceans subcategorized) | Percentage (95% CI) of US children aged 0-2 with convincing shellfish allergy: 0.6 (0.4-1.0)  Percentage of US children aged 0-2 both crustaceans and mollusk allergies: 0.2 (0.1-0.6)  Percentage of US children aged 0-2 with any convincing crustacean allergy: 0.5 (0.3-0.8)  Percentage of US children aged 0-2 with any convincing mollusk allergy: 0.3 (0.2-0.6)  Percentage of US children aged 0-2 with convincing crustacean allergy only (no mollusk allergy): 0.2 (0.1-0.4)  Percentage of US children aged 0-2 with convincing mollusk allergy only (no crustacean allergy): 0.12 (0.06-0.23)  Percentage (95% CI) of US children aged 0-2 with physician-diagnosed convincing shellfish allergy: 0.3 (0.1-0.6)  Percentage of US children aged 0-2 both physician-diagnosed crustaceans and mollusk allergies: 0.05 (0.02-0.12)  Percentage of US children aged 0-2 with any physician-diagnosed convincing crustacean allergy: 0.2 (0.1-0.3)  Percentage of US children aged 0-2 with any physician-diagnosed convincing mollusk allergy: 0.2 (0.1-0.5)  Percentage of US children aged 0-2 with physician-diagnosed convincing crustacean allergy only (no mollusk allergy): 0.1 (0.1-0.2)  Percentage of US children aged 0-2 with physician-diagnosed convincing mollusk allergy only (no crustacean allergy): 0.14 (0.03-0.57) |  | "Crustaceans (shrimp, crab, lobster, etc) and mollusks (clam, oyster, mussel, scallop, etc) have some immunologic cross-reactivity, and there is a paucity of data evaluating the epidemiology of crustacean allergy and mollusk allergy separately, especially in children. A recent meta-analysis examining SA globally found difficulty in comparing results because of the high level of heterogeneity among the studies and too few studies examining prevalence. The present study bridges this gap in the literature and not only estimates the prevalence, characteristics, and severity of SA but also compares the differences between crustacean allergy and mollusk allergy by leveraging a sample of more than 38,000 US children, using a comprehensive sampling approach and a strict diagnostic algorithm to confirm self-reported SA prevalence." |
| Wang L. 2021 | Cohort study | Y | N | Y | Pregnant women attending the Gansu Provincial Maternity and Child Care Hospital from 2010-2012 and their children | 10,179 pregnant women and their children | China | N | Mussels | Shrimp and crab | Birth outcomes: preterm birth | Association between shellfish consumption and preterm birth OR=0.45, 95% CI = 0.26-0.76, p = 0.003 |  | "The aim of this study was to determine how the consumption of fish and shellfish during pregnancy affected the risk of preterm birth. We hypothesised that higher intake of fish and shellfish was associated with lower risk of preterm birth." |
| Wang Y.F. 2008 | Cohort study | Y | N | N | Pregnant women recruited from a Taichung medical center in central Taiwan between December 2000 and November 2001 | 20 | Taiwan | N | All shellfish | All shellfish | PBDEs and congeners of PBDEs in breast milk | Deference in PBDE levels and eating shellfish:  <9 times/month (n=15): 3.98 (geometric mean)  ≥9 times/month (n=5): 2.15  p value (without any adjustment): 0.004  p value (maternal age, pre-pregnant BMI, and parity were adjusted by linear regression): 0.002  Significant association between the ratios of PCB153/BDE47 (p= 0.017), PCB153/BDE153 (p< 0.001), and PCB153/PBDEs (p= 0.001) and higher consumption of shellfish after adjusting for women’s age, pre-pregnant BMI, and parity (table 6) | The deference of 9 different PBDE congeners and shellfish consumption are also listed in table 4 | "The aim of this study was to examine levels of PBDEs in breast milk associated with seafood consumptions of Taiwanese mothers." |
| Wu M. 2012 | Cohort study | Y | N | Y | Pregnant women recruited in a maternity hospital in a major city in each region of China | 1,323 mother-neonate pairs | China | N | All shellfish | Shrimp and crab | Umbilical cord blood mercury levels | Shellfish consumption during pregnancy was a risk factor for Hg exposure (OR = 2.21) (95% CI: 0.21-1.37) (p = 0.007) |  | "The aims of this study were: firstly, to investigate the total Hg levels in infant umbilical cord blood samples across different cities in China; secondly, to assess the correlates of Hg exposure; thirdly, to provide strategies in order to prevent Hg exposure in utero." |
| Wu T-C. 2012 | Cross-sectional study | N | N | Y | Children less than 3 years old recruited from six outpatient departments in norther, middle, southern, and eastern Taiwan as they were brought in for routine health examination | 813 | Taiwan | N | All mollusks | Shrimp and crab | Shellfish allergy and allergic reactions | Prevalence of shrimp allergy: 5/813 (0.615%)  Prevalence of crab allergy: 3/813 (0.369%)  Prevalence of mollusk allergy: 1/813 (0.123%) |  | "The aim of this study was to assess the prevalence of self-reported and expert-screened food allergy in an unselected population of children and adults in Taiwan." |
| Zhao 2019 | Cohort study | Y | N | N | Pregnant women from the Laizhou Wan Birth Cohort (LWBC) | 506 | China | N | All shellfish | Shrimp and crab | Urinary bisphenol A (BPA) concentrations | Compared to women who "seldom consumed shellfish", there were significantly higher urinary BPA levels among women who "always consumed shellfish" (β = 0.341; 95% CI: 0.022,0.66; p = 0.04) |  | " The aims of our study were to study the levels, calculate the EDIs, and assess the risk of pre-natal exposure to BPA among pregnant women recruited in a cohort and to explore the potential association between BPA exposure and seasonal variation, diet, and sociodemographic characteristics." |