

below the analytic method's limit of detection (LOD), making estimation of exposure levels challenging. The concentration of each chemical relative to THC is related to the concentration of the chemical and THC in the source crude oil. Knowing these relationships, we can develop models to predict concentrations of individual chemicals from THC concentrations when only a THC concentration was detectable. The goal of this study was to determine the correlations between concentrations of the various oil chemicals and THC for use in situations where only THC was above the LOD.

Method We calculated correlations on the rig ships and support vessels located near the well by vessel and time period using linear regression analysis that accounts for censored data.

Results We found significant differences in correlations between concentrations of the chemicals and THC across vessels and over time that likely reflect different vessel activities and degrees of crude oil weathering throughout the response and clean-up efforts.

Conclusions Correlations between concentrations of the chemicals of interest and THC can be used to estimate the chemical's concentration when its measurement is below the LOD.

0297 THE PREVALENCE OF RISK FACTORS ASSOCIATED WITH COMPUTER VISION SYNDROME AMONG COMPUTER WORKS IN SÃO PAULO, BRAZIL

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Objectives The aims of this study were to investigate work conditions, to estimate the prevalence and to describe risk factors associated with Computer Vision Syndrome among computer works in São Paulo.

Method The methods include a quantitative cross-sectional observational study and an ergonomic work analysis, using work observation, interviews and questionnaires. The case definition was the presence of one or more specific ocular symptoms answered as always, often or sometimes. The multiple logistic regression model, were created using the stepwise forward likelihood method and remained the variables with levels below 5% ($p < 0.05$).

Results The operators were mainly female and young (from 15 to 24 years old). The call centre was opened 24 h and the operators weekly hours were 36 h with break time from 21 to 35 min per day. The symptoms reported were eye fatigue (73.9%), "weight" in the eyes (68.2%), "burning" eyes (54.6%), tearing (43.9%) and weakening of vision (43.5%). The prevalence of Computer Vision Syndrome was 54.6%.

Conclusions The organisation and psychosocial factors at work should be included in prevention programs of visual syndrome among call centres' operators.

0298 TECHNICAL EPIDEMIOLOGICAL NEXUS (NTEP) IN BRAZIL: A CRITIC EVALUATION AFTER 5 YEARS OF ITS APPLICATION

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Objectives A study has been made regarding the 5 years of Technical Epidemiological Nexus' application, analysing the amounts

collected, the number of occupational accidents recognised in the period, the benefits granted and the main diseases recognised as accidentary.

Method It has been performed a bibliographic review of the literature, a study of chapters from books, scientific articles published and research on the *website* of the Social Providence, evaluating the statistic data from 2007 to 2011 and comparing with the last years without the new previdenciary legislation.

Results From the application in NTEP for the recognition of accidents and aggravations to workers' health, the values collected by INSS increased progressively, with an increase of 14.8% in 9 months of 2007. The number of benefits granted rose 4,3%, from 4 million in 2006 to 4.8 million in 2011. With NTEP there has been an increase in the number of pathologies related to occupation recognised by INSS. Of the 653.1 thousands accidents recognised in the year of 2007, 131.6 thousands (20,15%) were recognised by the new rule, without the need of occupational accident communication. The pathologies of the spine (CID M54) and the ones of the shoulder (CID M75) are among the ones of highest incidence as occupational pathologies.

Conclusions In the five years applying the technical epidemiological nexus there were increases in levy of the INSS from the number of benefits granted and the recognition of occupational accidents, the pathologies of the shoulder and spine being the highest ones to increase after the new rule.

0299 THE NIEHS GULF STUDY: RECALCULATION OF EXPOSURE MEASUREMENT DATA BETWEEN THE LIMIT OF DETECTION (LOD) REPORTED BY THE LABORATORY AND THE ANALYTICAL METHODS' LODS

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Objectives BP contractors collected nearly 25 000 personal passive dosimeter samples (about 150 000 individual exposure measurements, primarily benzene, ethylbenzene, toluene, xylene and total hydrocarbon (THC)), related to the response and cleanup of the Deepwater Horizon oil spill. BP used a sampling strategy based on compliance with applicable occupational exposure limits (OELs). Most of the measurements were below the reported limit of detection (censored). This occurred because the analytic laboratories calibrated their instruments relative to the chemicals' OELs and they reported measurements below the lowest calibration standard (approximately 5% of the OEL) as less than the LOD. In an epidemiology study, however, all exposure levels are of interest rather than only those levels related to an OEL. Published evaluation studies on the analytical methods indicate that the methods were capable of measuring much lower concentrations than those reported. This presentation discusses the process used to recalculate the measurement data to the analytic method's LOD.

Method Gas chromatograph output, the dosimeters' and chemicals' physical property data, and the slope and intercept of calibration curves were used to calculate concentrations below reported LODs.

Results The recalculation effort resulted in the reduction of all censored measurements from 92.8% to 60.2% and the THC censored measurements from 71.9% to 19.1%.

Conclusions The recalculation resulted in a substantial reduction in the number of measurements below the LOD. The degree of censoring after recalculation is well within the operating range of the statistical methods used in the GuLF STUDY to estimate exposure levels.

0300

THE NIEHS GULF STUDY: A COMPARISON OF THE β -SUBSTITUTION METHOD AND A BAYESIAN APPROACH FOR HANDLING HIGHLY CENSORED MEASUREMENT DATA

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Objectives Over 150 000 measurements taken on workers responding to the 2010 Deepwater Horizon oil spill are being used to develop exposure estimates for the participants in the GuLF STUDY. A large portion of the measurements, however, has values below the limit of detection (left-censored). The β -substitution method has been shown to provide accurate estimates for handling censored data, but a comparison to a Bayesian method, which permits the estimation of uncertainty and accounts for prior information, is currently lacking. The goal of this research was to compare the two methods.

Method Each method was challenged with computer-generated datasets drawn from lognormal distributions with the geometric mean (GM) = 1, sample sizes = 5–100, geometric standard deviation (GSD) = 2–5, and percent censoring = 10–90%. Percent bias and coverage (the percentage of 95% uncertainty intervals containing the truth) were used as evaluation metrics.

Results For most of our simulation scenarios, estimates of bias from the β -substitution and Bayesian methods were generally comparable for the AM and GM. The β -substitution was generally less biased in estimating the GSD and the 95th percentile than the Bayesian method. The Bayesian method provided consistently better coverage for the AM than β -substitution. It also provided uncertainty estimates the GM, GSD, and the 95th percentile while β -substitution does not.

Conclusions The β -substitution method generally was observed to have little bias but it only allows the calculation of uncertainty estimates around the AM. The Bayesian approach provided reasonably accurate point and interval estimates (i.e., coverage), but this comes with the cost of additional computation.

0301

USE OF ACETOCHLOR AND CANCER INCIDENCE IN THE AGRICULTURAL HEALTH STUDY COHORT

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Objectives Since its registration in 1994, acetochlor, an herbicide licensed for use on corn, has been one of the most commonly used pesticides in the US. We evaluated use of acetochlor and cancer incidence in the Agricultural Health Study, a prospective cohort of licensed pesticide applicators.

Method During a telephone interview administered from 1999–2005, participants provided information on acetochlor use and other factors. Total lifetime days of acetochlor use were calculated and an intensity-weighting algorithm was applied that accounted for factors that modify exposure. We used Poisson regression to estimate relative risks (RR) and 95% confidence intervals (CI) for cancers that occurred from the time of interview through 2011 in Iowa and 2010 in North Carolina. We examined all cancer sites together, and individual sites with >10 exposed cases.

Results Among 33 484 men, 3234 incident cancers and 304 acetochlor-exposed cases occurred. An increased risk of lung cancer was observed among ever users of acetochlor (n = 23) (RR=1.57; CI=0.95–2.59) compared to never users, but there was no evidence of an exposure response trend (p-trend=0.30). Also, there was increased risk of colorectal cancer (n = 25) with high acetochlor use (RR=1.60; CI=0.97–2.65, p-trend=0.14).

Conclusions The associations between acetochlor use and colorectal and lung cancer are novel. However, due to lack of exposure-response trend, small number of exposed cases, and relatively short time between acetochlor use and cancer development, these findings warrant caution in interpretation and further investigation.

0302

INCIDENCE OF SICKNESS ABSENCE AMONG BRAZILIAN PUBLIC WORKERS

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Objectives Investigate the incidence and risk factors of sickness absence (SA) among Brazilian public workers.

Method It is a dynamic cohort composed by all public workers of the Goiania municipality hired from January, 2005 to December, 2011 where certified SA data were analysed. Incidence density (ID) was calculated per 1.000 person-years in each ICD-10 category. We used multiple logistic regression analysis to estimate the association between SA and socioeconomic and occupational characteristics.

Results 18.450 workers contributed to 49.410 06 person-years and 7.044 (38.2%) employees had at least one certified episode of SA. The ID of sickness absence was 142.5 per 1.000 person-years. This rate was significantly higher among women (155.5). Diagnostic groups with the highest sick leave ID were for injury (32.3) and musculoskeletal diseases (15.3). The logistic analysis showed association between SA and the female gender (OR 1.46 CI95% 1.35–1.58), low education (OR 1.34 CI95% 1.18–1.52), low salary (OR 1.82 CI95% 1.61–2.05), multiple work contracts (OR 1.56 CI95% 1.46–1.66) and was greater among professionals in the health field (OR 1.73 CI95% 1.55–1.92).

Conclusions On average, 14% of workers received a SA certificate each year, and the socioeconomic and occupational characteristics were associated with higher rate of certification. This study suggests an increased risk according to the professional category, the field of education was more associated with mental