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FortisBC Inc.
Application for a Certificate of Public Convenience and Necessity (CPCN) for the Advanced Metering Infrastructure (AMI) Project - Project No. 3698682

UNDERTAKING No. 8

HEARING DATE: March 7, 2013

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REQUESTOR: David Aaron, CSTS

WITNESS: Dr. William Bailey and Dr. Yakov Shkolnikov

QUESTION: Mr. Aaron requests that Dr. Bailey and Dr. Shkolnikov calculate whether 72 minutes of phone use per day, every day for 20 years put a user into the "heavy users" category as defined in the INTERPHONE study.

RESPONSE:

This undertaking involves comparing the cumulative call times reported in Table 3 of the 2010 INTERPHONE Study[1] to 72 minutes per day of cellular phone exposure..

The data provided in table were obtained by the authors of the 2010 INTERPHONE from the responses of the cases and controls to written survey questionnaires and, in some instances, personal interviews.

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[1] The INTERPHONE Study Group, "Brain tumour risk in relation to mobile telephone use: results of the INTERPHONE international case–control study," International Journal of Epidemiology 2010;1–20, doi:10.1093/ije/dyq079

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Table 3 ORs between mobile phone use and brain tumours (meningioma and glioma separately) by cumulative call time, stratified by recency of starting regular use—excludes use with hands-free devices

	Meningioma			Glioma		
	Cases	Controls	OR[a] (95% CI)	Cases	Controls	OR[a] (95% CI)
Cumulative Call time (h)						
	Non-regular users					
	1147	1174	1.00	1042	1078	1.00
	Short-term users: start of phone use 1–4 years before reference date					
<5 h	150	186	0.92 (0.69–1.22)	127	182	0.68 (0.50–0.93)
5–114.9	401	500	0.74 (0.61–0.90)	449	533	0.82 (0.67–0.99)
115–359.9	95	126	0.79 (0.55–1.12)	121	154	0.74 (0.52–1.03)
360–1639.9	67	72	0.77 (0.49–1.20)	80	95	0.75 (0.50–1.13)
⩾1640	22	5	4.80 (1.49–15.4)	23	8	3.77 (1.25–11.4)
	Medium-term users: start of phone use 5–9 years before reference date					
<5 h	7	9	0.67 (0.23–1.96)	10	13	0.86 (0.32–2.28)
5–114.9	122	145	0.73 (0.54–0.98)	180	208	0.86 (0.66–1.12)
115–359.9	95	140	0.67 (0.48–0.93)	156	192	0.71 (0.53–0.95)
360–1639.9	129	131	0.83 (0.60–1.14)	174	204	0.72 (0.54–0.95)
⩾1640	64	62	1.03 (0.65–1.65)	94	73	1.28 (0.84–1.95)
	Long-term users: start of phone use ⩾10 years before reference date					
<5 h	3	2	1.31 (0.21–8.07)	4	2	1.13 (0.16–7.79)
5–114.9	14	15	0.79 (0.36–1.73)	20	25	0.63 (0.32–1.25)
115–359.9	14	22	0.49 (0.24–1.01)	41	42	0.89 (0.53–1.50)
360–1639.9	35	33	1.00 (0.58–1.72)	94	90	0.91 (0.63–1.31)
⩾1640	44	40	0.95 (0.56–1.63)	93	73	1.34 (0.90–2.01)

[a]ORs adjusted for sex, age, study centre, ethnicity in Israel and education.

Figure 1: Table 3 of the 2010 INTERPHONE Study. Blue shading indicates statistically significant results.

Figure 1 shows the results of the INTERPHONE study that are summarized in Table 3. Blue boxes around odds ratios (OR) and 95% confidence intervals indicate ORs that are statistically significantly different from 1.0. The figure highlights ORs where the lower range of the 95% confidence interval is > 1.0 (i.e., the cases have a significantly greater odds of mobile phone use than the controls) and those ORs for which the upper range of the 95% confidence interval is less than 1.0 (i.e., the cases have a significantly lower odds of reporting use of mobile phones than the controls). If these associations reported in the INTERPHONE study were to be interpreted as showing a causal relationship between mobile phone use and cancer, those ORs less than 1.0 would suggest that mobile phone use for a given duration and cumulative call time is protective and reduces likelihood of brain tumors; likewise, an OR of greater than 1.0 would suggest that mobile phone use for a given duration and cumulative call time increases the likelihood of brain tumors.

Table 3 summarized ORs for heavy users for short-, medium-, and long-term durations of reported mobile phone use. The "heavy user" group in INTERPHONE study was described as those participants who self-reported more than 1640 hours of lifetime use. In this table, lifetime duration of use was categorized as 1–4 years, 5–9 years, or ≥ 10 years. Note that for these three durations of mobile phone use, the only associations between glioma (and meningioma) that were statistically significantly greater than > 1.0 were reported for the short-term user group (those who started using a mobile phone 1–4 years before the reference date), and not for persons who had used a mobile phone for 5–9 years (medium-term) or ≧ 10 years (long-term). So, only users who accumulated at least 1640 hours of use within 1–4 years had a statistically significantly increased odds of brain tumors (glioma and meningioma), and it is for this group that comparisons to the time of use of FortisBC AMI advanced meter were performed.

At 72 minutes a day of phone use, it would take 3.7 years to reach 1640 hour of total phone use, but this time period cannot be extrapolated to AMI meter exposure.

72 minutes of exposure is based on the theoretical maximum duty cycle of an AMI meter. This is not a valid assumption with respect to actual duty cycle. The best estimate of FortisBC AMI advanced meter duty cycle that would be sustained for an extended period of time is the average duty cycle of 0.06 percent (approximately 52 seconds a day). At this duty cycle, it would take the advanced meter 312 years to reach the heavy user group (1640 hours) time of use.

Even if the duty cycle, assumed to be the maximum observed 24-hour duty cycle for a group of 6,865 meters of 0.58 percent, is used (approximately 501 second a day), it would take the advanced meter 32 years to reach the heavy user group. This observed maximum duty cycle occurred in only 0.03 percent of the total meter population as noted in Exhibit B-11, Response to BCSEA IR1 55.5, so even this estimate is improbable.

Therefore, the observed duty cycle will be substantially less than 5%. Moreover, if the duty cycle were to be less than 5% for even a small fraction of the time, it would take longer than 4 years to reach the heavy user group time of use. In the INTERPHONE study, mobile phone users who accumulated at least 1640 hours of use during more than 4 years did not have significantly increased odds of brain cancer as shown in Figure 1.

FortisBC notes there are other issues to consider:

- The assumed 5% duty cycle of the Itron OpenWay AMI meter is not observed in field tests (Exhibit B-11, Response to BCSEA IR1 55.5).

- Mobile phone transmission time could be significantly less than the call time depending on the protocol and the conversation rate; mobile phones have a duty cycle of less than 100% even during the call. Therefore, an appropriate comparison would include comparison of transmission times (rather than call times) of mobile phones to transmission times of FortisBC AMI smart meters.

- The heavy user group in the INTERPHONE study can be assumed to have been exposed to mobile phone signal for the duration of the calls, while home residents are likely to leave the house for some period of time and thus reducing their advanced meter time of use.

- Mobile phone call time does not include any continued cell phone exposure time that may occur while the phone is in standby mode. Peak exposure from a mobile phone is much greater than from a FortisBC AMI smart meter; this factor should necessarily be considered when comparing exposures (peak, average, or cumulative) between a mobile phone and a smart meter. For example, a mobile phone at the head will typically produce a peak measured SAR that is approximately 60% of Safety Code 6. This compares to a peak exposure from a FortisBC AMI smart meter of 15.7% of the Safety Code 6 limit (even at a distance of only 0.5 meters in front of the smart meter, a position unlikely to be maintained on uninterrupted basis for several years).