

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF NEW YORK

CENTRAL RABBINICAL CONGRESS OF:

THE USA & CANADA, *et al.*,

Plaintiffs,

vs.

NEW YORK CITY DEPARTMENT OF

HEALTH & MENTAL HYGIENE, *et al.*,

Defendants.

Case No.: 12-Civ.-7590

Judge Naomi Reice Buchwald

AFFIDAVIT OF DR. AWI FEDERGRUEN, D.SC.

1. I am the Charles E. Exley Professor of Management and former Chair of the Decision, Risk and Operations Division of the Graduate School of Business at Columbia University. I joined the faculty of Columbia University in 1979 after receiving my doctorate in Operations Research at the University of Amsterdam in the Netherlands, and after serving as a Research Fellow at the Mathematical Centre in Amsterdam and a faculty member at the Graduate School of Management of the University of Rochester. From 2002-2007, I served as the Academic Dean of the Columbia Business School. I am an expert in various areas of quantitative methodology, in particular, the areas of applied probability and stochastic models, applied primarily to supply chain management, marketing and financial models.

2. I have carefully reviewed the recent report ("the Report"), published on June 8, 2012, by the Centers for Disease Control and Prevention in its *Morbidity and Mortality Weekly Report*, which attempts to prove, based on an investigation conducted by New York City's Department of Health and Mental Hygiene, that neonatal Herpes simplex infection (HSV-1) can be transmitted through orogenital suction, in Hebrew called *metzitzah b'peh* (MBP), performed as part of Jewish ritual circumcision. I have examined and studied, in light of my knowledge and experience in the area of statistical analysis, the findings recorded by the Report, as well as the conclusions drawn from them.

3. In my professional opinion, there are serious flaws in the Report's methodology and analysis, invalidating the primary conclusion of the Report, *i.e.*, that the incidence of HSV-1 infections is statistically, significantly higher among baby boys exposed to MBP, compared to the general population of neonatals. *A fortiori*, it invalidates the Report's conclusion that MBP is a significant risk factor with respect to these infections.

4. More specifically, to reach its conclusion that MBP increases the risk of transmission of HSV-1, the Report relied on a statistical comparison between the incidence rate of HSV-1 in male children presumed to have had MBP in New York City, and the incidence rate of HSV-1 in the general male neonatal population in the city. Especially given the very small number of claimed cases in New York City – 5 cases over 5.75 years – a more powerful statistical study could have been developed by pooling the NYC data with those available from Israel. Recent data from Israel’s Ministry of Health, provided to me by Dr. Avraham Steinberg, director of the Medical Ethics Unit of Shaare Zedek Medical Center in Jerusalem, indicate 10 suspected cases of HSV-1 subsequent to MBP in the past 5.75 years (January 1, 2007-September, 2012). Confining oneself to the “ultra-Orthodox” community as the community practicing MBP, the average of four recent estimates has the size of this population segment in Israel at 606,000. A recent paper in the economics literature estimates the annual birthrate in this community to be 6%, resulting in an estimate of 18,180 boys exposed to MBP, annually. Over the 5.75-year study period, 10 reported HSV-1 cases among 104535 (= $5.75 \times 18,180$) newborn male babies implies that the incidence rate among those practicing MBP in Israel is in fact comparable to that in the general NYC population, not exposed to MBP (9.6 as opposed to 7.1 per 100,000). The comparison is particularly meaningful since the estimated sero-prevalence of HSV-1 is virtually identical in the US and Israeli populations (57.7%¹ and 59.8%² respectively), and in fact slightly higher in the latter.

5. However, even if the Israeli data are ignored and the statistical analysis is confined to the NYC data, there are serious flaws in the methodology and analysis of the Report. Specifically, the investigators estimated that the number of male infants born in New York City who did not have MBP performed during the relevant time period was 352,411. As there were twenty-five reported cases of neonatal HSV-1 infection in this group, the baseline rate of neonatal HSV-1 infection was therefore estimated to amount to 7.1 per 100,000. *Most importantly*, the investigators further estimated that the number of boys born during this time who were likely to have had MBP was 20,493. Accordingly, based on a 7.1 per 100,000 rate, they inferred that the expected number of HSV-1 cases arising from that subgroup should have been 1.46. The Report claims, however, to have identified five cases in this group. While recognizing that, due to randomness, the actual number of cases in any subgroup deviates from its expected or average value—in this case by a mere 3 cases—the Report concluded that the incidence rate in the MBP subgroup was *significantly* higher, based on a so-called risk ratio test.

6. The validity of the statistical test employed is very questionable, in particular the formulae employed to compute the boundary points of the confidence interval for the ratio of the incidence rates in the MBP and general population.

¹ F. Xu, *et al.*, “Trends in Herpes Simplex Virus Type 1 and Type 2 Seroprevalence in the United States,” (2006) *Journal of the American Medical Association* 296(8), 964-973.

² B. Davidovici, *et al.*, “Decline in the prevalence of antibodies to herpes simplex virus types 1 and 2 among Israeli young adults between 1984 and 2002,” (2006), *Sexually transmitted diseases* 33(11), 641-645.

7. However, even if this methodological question is set aside, the fundamental problem with the analysis is that it seriously underestimates the number of children who were likely to have had MBP during the relevant time period. The Report arrived at its estimate of 20,493 as follows: Initially, the authors obtained the number of boys entering full-day or half-day kindergarten in Jewish day schools in New York City in 2010 (6,197). The Report then used New York City data included in a national census of *the total K-12 population* in Jewish day schools to conclude that 43% (2,665) of those students would be attending Hasidic schools and 29% would attend Yeshiva schools (1,767). It next assumed that 100% of students entering Hasidic schools (2,665), and 50% of those entering Yeshiva schools (899) would have had MBP. Finally, it assumed that none of the boys attending schools affiliated with other segments of the Jewish community would have had MBP. This yielded an estimated annual population of 3,564, which was multiplied by 5.75 (to account for the years addressed by the Report) to arrive at a total of 20,493.

8. Rather than making assumptions about the percentage of Jewish boys in the Hasidic, Yeshiva, and Other school systems based on the general K-12 population data, the Report could and should have relied on exact enrollment data pertaining specifically and directly to all (registered) full- and half time kindergartens, since it is the aggregate 2010 *kindergarten* population of 6,197 that needs to be decomposed by community type (Hasidic, Yeshiva, or Other). These data are publicly available from the New York State Education Department. Since virtually all of these schools cater uniquely to either the Hasidic, Yeshiva, or Other community, it is therefore possible to arrive at a close-to-exact count of the total number of kindergarten boys in these three community segments. Exhibit 1, attached, is the New York State Education Department spreadsheet, where I have indicated which of the schools are in NYC and cater to each of the three communities. This direct count of the number of boys enrolled in Hasidic kindergartens reveals, for example, that this group represents 69% of the kindergarten cohort, well above the Report's assumed 43%. This difference is consistent with the well documented phenomenon that the relative size of the Hasidic community is rapidly growing as a result of dramatically larger birthrates in that community. (*See* Exh. 2.) As for the Yeshiva population, it actually represents only 23% of the kindergarten cohort (not 29%).

9. Thus, while the Report estimates the number of male infants who were likely to have had MBP as 20,493, my own analysis based on the precise kindergarten enrollment data shows that this number is seriously underestimated by approximately 50%: The 69% of the kindergarten cohort that are Hasidic represent 4,276 boys and the 23% that are part of the Yeshiva community another 1,426. Even when adopting the Report's assumption that only 50% of the latter community practice MBP, this results in an annual total of 4,989, and a total of 28,685 over the full 5.75 year study period. In other words, the above-described direct assessment of the size of the MBP population would place this figure at close to 30,000, nearly 50% higher than the Report's estimate.

10. This single correction alone invalidates the conclusion that the incidence rate among the MBP population is significantly larger than in the general NYC

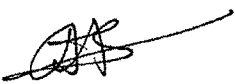
population, regardless of which of several possible statistical tests is applied and even if the tests aimed for an unusually low level of confidence.

11. The above analysis does not even attempt to correct the Report's assumption about the percentage of the Yeshiva community that undergoes MBP, or its assumption that nobody outside the Hasidic and Yeshiva community does so. As to the former assumption, the Report provides no substantiation for its assumption that the MBP rate within this community is 50%. (Most authorities believe it to be significantly higher.) Moreover, the theory that no male infants who were not members of the Hasidic or Yeshiva communities had MBP is belied by the Report itself. The authors themselves admit that this assumption might not be valid, noting that "not all of the cases [of HSV in male infants that likely had MBP] were in ultra-Orthodox Jewish families." Accordingly, the Report itself conceded that "estimates of the exposed population might be underestimated." In addition, the Report completely ignores the population of Sephardic Jews, most of whom do not belong to the Hasidic or Yeshiva communities but some (if not most) of whom nonetheless practice MBP.

12. My professional opinion is that the Report's analysis, and specifically its assumptions regarding the number of male infants likely to have had MBP, are deeply flawed, casting serious doubt on the validity of the Report's findings.

I declare under penalty of perjury under the laws of the State of New York that the foregoing is true and correct to the best of my knowledge.

Executed this 10th day of October, 2012, at New York, New York.



Awi Federgruen

STATE OF NEW YORK
COUNTY OF new york

Subscribed and sworn before me this 10th day of October, 2012.


Notary Public

My commission expires on:

