hotel fire on December 31, 1986. The samples remained refrigerated until being mailed frozen to a second laboratory for testing (received March 26, 1987). The samples were frozen upon arrival and were thawed and refrozen several times during the next 3 months for experimental purposes. After sonication and filtration, the samples were analyzed on a CO-oximeter IL-282 (sensitivity not given). The authors concluded that aging of blood samples and methods of storage could affect accuracy of analytic results. This result was supported by another study, which determined that the contact of the sample with air could decrease the percent of COHb saturation (Chace et al. 1986). That result is in contrast to reports that CO would be stable for months to years in stored samples (vacutainer tubes, especially heparin-anticoagulated tubes) (Kunsman et al. 2000; Hampson 2008). Proper storage of samples would prevent loss of CO (Nelson 2006b).

4.3.2. Influence on Collection Site on Measured COHb Concentrations

Reductions in the percent of COHb saturation are also associated with differences between COHb measurements derived from heart blood and from peripheral blood specimens. Levine et al. (2002) studied data from 42 CO poisoning cases. The Office of the Chief Medical Examiner in the state of Maryland provided the data. Blood samples from the heart and the subclavian veins were analyzed in a CO oximeter. The specific heart site for blood collection was not reported. Also, the report did not indicate whether the deceased individuals with decreased COHb were given oxygen therapy. Blood samples with COHb saturation levels greater than 12% were confirmed and quantitated by gas chromatography. The latter analysis measured both CO content and CO capacity and did not measure hemoglobin concentration, which tends to vary in postmortem specimens (Levine et al. 2002). Samples were normalized for hemoglobin, ensuring that differences between the heart blood and peripheral blood were not caused by significant differences in hemoglobin between the two blood samples. The average heart blood COHb level was 42% (range = 11-79; SD = 19.95; median = 38), and the average peripheral blood COHb level was 39% (range = 4.2-71; SD = 17.07; median = 37). The average heart blood to peripheral blood (H:P) ratio was 1.09. Sixty-two percent of the cases (26 of 42) had an H:P ratio of 0.9 to 1.1, whereas 74% of the cases (31 of 42) had an H:P ratio of 0.8 to 1.2. Statistical analysis showed no statistically significant differences in COHb levels between heart and peripheral blood samples (Levine et al. 2002). The report acknowledged that there might be instances (e.g., cardiopulmonary resuscitation) where differences between heart blood and peripheral blood COHb levels might occur in isolated cases, but in general, there were no significant differences between the two blood sources.

Dalpe-Scott et al. (1995) calculated the H:P ratio of drug concentrations in postmortem blood samples for 113 drugs representing 320 cases. Thirty-five CO