

rate designed to reflect the market value of such labor (e.g., median wage for household domestic labor). This reduced utility is variously referred to as lost leisure or a component of pain and suffering. Ideally, a comprehensive willingness to pay (WTP) estimate would be used that includes all categories of loss in a single number. However, a review of the literature indicated that the available studies were not suitable for valuing

cryptosporidiosis; hence, estimates from this literature are inappropriate for use in this analysis. Instead, EPA presents two COI estimates: a traditional approach that only includes valuation for medical costs and lost work time (including some portion of unpaid household production); and an enhanced approach that also factors in valuations for lost unpaid work time for employed people, reduced utility (or sense of well-being) associated with

decreased enjoyment of time spent in non-work activities, and lost productivity at work on days when workers are ill but go to work anyway.

Table VI-3 shows the various categories of loss and how they were valued for each estimate for a "typical" case (weighted average of severity level—see LT2ESWTR EA—Chapter 5 for more details (USEPA 2003a).

TABLE VI-3.—TRADITIONAL AND ENHANCED COI FOR CRYPTOSPORIDIOSIS

Loss category	Traditional COI	Enhanced COI
Direct Medical Costs	\$93.82	\$93.82
Lost Paid Work Days	109.88	109.88
Lost Unpaid Work Days ¹	20.22	40.44
Lost Caregiver Days ²	20.70	54.31
Lost Leisure Time ³	⁵	333.96
Lost Productivity at Work	⁵	112.49
Total ⁴	244.62	744.89

¹ Assigned to 38.2% of the population not engaged in market work; assumes 40 hr. unpaid work week, valued at \$5.46/hr in traditional COI and \$10.92/hr in enhanced COI. Does not include lost unpaid work for employed people and may not include all unpaid work for people outside the paid labor force.

² Values lost work or leisure time for people caring for the ill. Traditional approach does not include lost leisure time.

³ Includes child care and homemaking (to the extent not covered in lost unpaid work days above), time with family, and recreation for people within and outside the paid labor force.

⁴ Detail may not calculate to totals due to independent rounding; Source: Appendix L in LT2ESWTR EA (USEPA 2003a).

⁵ Not included.

The various loss categories were calculated as follows: Medical costs are a weighted average across the three illness severity levels of actual costs for doctor and emergency room visits, medication, and hospital stays. Lost paid work represents missed work time of paid employees, valued at the median pre-tax wage, plus benefits of \$18.47 hour. The average number of lost work hours per case is 5.95 (this assumes that 62 percent of the population is in the paid labor force and the loss is averaged over seven days). Medical costs and lost work days reflect market transactions. Medical costs are always included in COI estimates and lost work days are usually included in COI estimates.

In the traditional COI estimate, an equivalent amount of lost unpaid work time was assigned to the 38% of the population that are not in the paid labor force. This includes homemakers, students, children, retirees, and unemployed persons. EPA did not attempt to calculate what percent of cases falls in each of these five groups, or how many hours per week each group works, but rather assumed an across-the-board 40 hour unpaid work week. This time is valued at \$5.46 per hour, which is one half the median post-tax wage, (since work performed by these groups is not taxed). This is approximately the median wage for paid household domestic labor.

In the enhanced COI estimate, all time other than paid work and sleep (8 hours per day) is valued at the median after tax wage, or \$10.92 per hour. This includes lost unpaid work (e.g., household production) and leisure time for people within and outside the paid labor force. Implicit in this approach, is that people would pay the same amount not to be sick during their leisure time as they require to give up their leisure time to work (i.e., the after tax wage). In reality, people might be willing to pay either more than this amount (if they were very sick and suffering a lot) or less than this amount (if they were not very sick and still got some enjoyment out of activities such as resting, reading and watching TV), not to be sick. Multiplying 16 hours by \$10.92 gives a value of about \$175.00 for a day of "lost" unpaid work and leisure (i.e., lost utility of being sick).

An estimate of lost unpaid work days for the enhanced approach was made by assigning the value of \$10.92 per hour to the same number of unpaid work hours valued in the traditional COI approach (i.e., 40 unpaid work hours per week for people outside the paid labor force). Lost unpaid work for employed people and any unpaid labor beyond 40 hours per week for those not in the labor market is shown as lost leisure time in Table VI-3 for the enhanced approach and is not included

in the traditional approach. In addition, for days when an individual is well enough to work but still experiencing symptoms, such as diarrhea, the enhanced estimate also includes a 30% loss of work and leisure productivity, based on a study of giardiasis illness (Harrington *et al.* 1985) which is similar to cryptosporidiosis. Appendix P in the EA describes similar productivity losses for other illnesses such as influenza (35%–73% productivity losses). In the traditional COI analysis, productivity losses are not included for either work or non-work time.

The Agency believes that losses in productivity and lost leisure time are unquestionably present and that these categories have positive value; consequently, the traditional COI estimate understates the true value of these loss categories. EPA notes that these estimates should not be regarded as upper and lower bounds. In particular, the enhanced COI estimate may not fully incorporate the value of pain and suffering, as people may be willing to pay more than \$201 to avoid a day of illness. The traditional COI estimate includes a valuation for a lost 40 hour work week for all persons not in the labor force, including children and retirees. This may be an overstatement of lost productivity for these groups, which would depend on the impact of such things as missed