

OREGON'S CD4 LYMPHOCYTE COUNT-BASED SURVEILLANCE FOR AIDS

UNDERPINNING our understanding of the AIDS epidemic—where we've come from, where we are, and where we're going—lie epidemiological surveillance data. Like a mighty river that ultimately derives from individual raindrops and snowflakes, the epidemic is built from individual case reports filed by physicians and others around the world. Collecting, collating, and analyzing these reports is a labor-intensive and hence expensive process, and it is worth considering modifications and improvements to the system.

The change in the AIDS case definition on January 1, 1993 (*CD Summary* 41(25); Dec. 15, 1992) to include HIV-infected persons with CD4 cell counts <200/ μ l (or <14% of the total lymphocyte count) provided an opportunity to modify our surveillance system. Oregon laboratories are now required to report low CD4 cell counts to the HIV Program at the Health Division (OHD). Reports must include the name of the physician who ordered the test and a patient identifier (a name or some other unique identifier determined by the physician ordering the test).

WHY LABORATORY SURVEILLANCE?

Monitoring the HIV epidemic has traditionally depended on physicians diagnosing and reporting patients with AIDS-defining clinical conditions. Surprisingly, these tallies are not always complete. Over time, Oregon and many other states adopted active methods to improve reporting completeness, such as review of death and hospitalization records. While effective, these methods are labor intensive and costly. Laboratory-based low CD4 lymphocyte count reporting (hereinafter "CD4 reporting") for AIDS surveillance was adopted to simplify reporting, reduce cost, and provide a reliable marker of HIV-related disease progression.

HOW DOES IT WORK?

CD4 reporting is managed by one person, who gives each report a number and enters it into a database. If a name is provided, it is matched against earlier reports of patients with a low CD4 cell count and the AIDS registry to determine if there is a previous record on the individual. If no match exists, the record is flagged and held for three weeks, allowing time for physicians to report. If no case report is filed, the physician who ordered the test is queried by mail. If necessary, a second letter and eventually phone calls from a staff epidemiologist are used to cajole recalcitrants.

DOES IT WORK?

We assessed three attributes to evaluate the value of CD4 reporting-based surveillance: positive predictive value, sensitivity, and timeliness. Positive predictive value is the proportion of patients with low CD4 cell counts who are HIV-positive. A high value indicates that the system targets the population of interest. Sensitivity, in this case, is the proportion of AIDS patients who have a low CD4 cell count. A high value suggests that the condition (AIDS) will likely be detected by the system. Timeliness refers to the lag between the patient's first low CD4 cell count (for CD4 reporting) or the first AIDS-defining condition (for traditional methods) and the time of report.

During the study period (May 1993-April 1994), we received 643 CD4 reports, and 278 AIDS case reports. HIV status was available for 94% of the

"CD4 cases"; of those, 96% were positive (i.e., a high positive predictive value). CD4 reports were received for 250 (90%) of the patients with AIDS case reports (i.e., high sensitivity).

How does CD4 reporting compare with traditional methods?

We compared CD4 cases with cases identified through traditional AIDS reporting methods between May 1993 and April 1994. CD4 cases were:

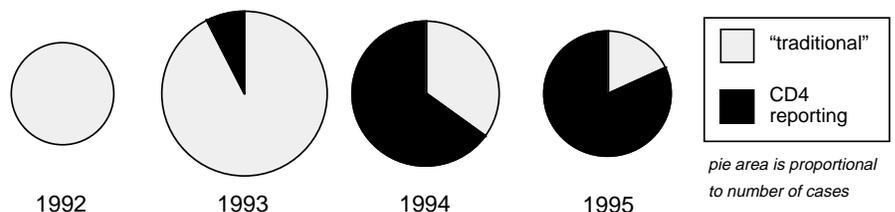
- less likely to be injection drug users (IDUs) than those found by traditional methods;
- less likely to be Hispanic; and were
- more likely to live in a rural area.

Furthermore, 27% of all AIDS cases were reported *only* through CD4 reporting. CD4 reporting was more timely; 92% of CD4 cases were reported within 30 days of diagnosis (cf. 61% of traditionally diagnosed cases). Finally, CD4 reporting was a less expensive system to maintain.

HOW PRACTICAL IS CD4 REPORTING?

Only a small proportion of patients (3%) reported with low CD4 cell counts were not HIV-positive, showing that few resources are wasted tracking down persons with low CD4 cell counts that are unrelated to HIV infection. As of the end of 1995, 7,019 low CD4 test reports (on 2,255 persons) had been logged; 40% of these had not been previously reported. Another 19% (of persons with low CD4 cell counts) were reported by providers before being queried by our system, indicating that CD4 reporting

Proportion of Oregon AIDS Cases First Identified through CD4 Reporting



could have elicited new case reports for at least 59% of the 2,255 individuals with low counts.

The proportion of AIDS cases initially reported under the CD4 lymphocyte rubric has increased rapidly (see figure, *verso*). In 1993, 10% of Oregon cases were first identified through CD4 reporting; this fraction jumped in 1994 and rose again in 1995. CD4 reporting is now the primary means of identifying new AIDS cases in Oregon.

The number of low CD4 test reports received by this system has increased from an average of 148 tests per month in 1993 to 208 per month in 1995. Although the number of tests has increased, the number of persons whose count drops below 200 for the first time (we could think of them as “potential new cases”) has remained in the range of 40-60 per month. This probably reflects the increasing use of CD4 testing for clinical staging purposes.

With few exceptions, CD4 reporting has been widely accepted by physicians. Most physicians respond promptly and enthusiastically to

initial inquiries, saving time, tax dollars, and improving the quality of the data. The few hold-outs are referred to ORS 431.110 et seq. and OAR 333-18-015 et seq. for a little light reading.*

CONCLUSIONS

The 1993 AIDS case definition provided an opportunity to reevaluate our AIDS surveillance methods. Laboratory surveillance of CD4 testing provided a potential means to reduce cost and improve reporting. In comparison to traditional methods, CD4 reporting was found to be more timely, highly sensitive, and to have a high positive predictive value. Reporting is simpler for physicians and has been widely accepted. In short, this is the greatest thing since sliced bread. Because of these advantages, CD4 reporting is now at the core of our AIDS surveillance system. That said, there is still a need to complement CD4 reporting with other methods to assure complete reporting and an accurate picture of the evolving AIDS epidemic. For more information, contact the HIV program (503/731-4029).

* sorry, no CME credit.

Influenza: End of the Season

AS THE EQUINOX approaches, the influenza season gives way to baseball in nature’s timeless rhythms. Effective April 1, the gratis testing of throat-washing specimens for influenza virus will be suspended until the autumn. As of March 18, the CPHL had received 540 specimens since the season opened in November; influenza viruses (all type A this year) were cultured from 80 of them. Needless to say, the actual number of influenza cases is unknown, but presumably somewhat higher. This, then, was a season of moderate activity in Oregon—more than last year, less than the year before that (see figure). Most isolates (83%) were from patients who had onset of illness before the end of calendar 1995.

Influenza activity is over in the Northwest, but sporadic cases were still being seen elsewhere at last report. The composition of next year’s vaccine was recently agreed upon by experts trying to predict the dominant strains of the 1996-97 season, and this past season’s A/Johannesburg/33/94 (H3N2) component has been dropped in favor of an A/Wuhan/359/95-like strain that will undoubtedly knock ‘em dead.

Hebdomadal Influenza Isolates and Specimens Received for Testing, Oregon CPHL, 1992-96

