

Matching Public Health Records

Garland Land

National Association for Public Health and Information Systems

There are at least four different types of public health needs to link files.

The first need is to link birth and death records. This requirement is needed to prevent persons from getting a birth certificate on a deceased person in an attempt to assume a false identity. Birth records of deceased persons are flagged so either the birth records are not issued or they are issued with a notation on the record that the person is deceased. This is important to prevent identity fraud.

Most states link their birth and death records through a computer algorithm that matches on name, date of birth, sex and possibly parents' names. For more recent births the social security number is also available. There are obvious issues in performing this linkage. The names on the birth certificate and death certificate may be different. There could be an error on the date of birth on the death certificate. There could be a gender change.

Most states use a computer algorithm that requires a one to one match on each variable. For the death records that don't match a birth record a second pass or third pass is done with less restrictive criteria. If there is a one to many match or no match then states rely on a manual matching process. Manual matching is normally required on 20-40% of the records. Because of the sensitive nature of mismatching a person as dead when they are alive it is essential that a very conservative process be used in computer and hand matching. Small states rely totally on manual matching.

The second type of linkage occurs in matching deaths with a public health registry such as cancer, TB, AIDS etc. The purpose is to purge the registry of deaths and to conduct longevity studies. Matching variables are similar to those used with birth records. In some cases the social security number may also be available on the registry file as it is on the death file. The computer matching algorithm employed is also similar to the one previously described depending on the size of the files. As with birth death matching it is important to keep the mismatches to a very low level.

The third type of linkage is what can be referred to as program integration. Birth records are used to establish a population base for immunization registers, new born screening programs, new born hearing programs and other child health programs. The intent is to establish the population that should be receiving services. Some states have a fully integrated child health system that links all child health program services in a single information system.

There is a wide variety of mechanisms used to link such files. Some states link the new born screening and hearing information with the birth record at the time of birth in the hospital. This is done by creating a number in the hospital that is entered into the newborn screening, new born

hearing and birth certificate systems. The number then can be used to link the systems. In other states separate data bases are created for each program and linked at later dates without a unique number.

Some states have created a central patient index that is used to update the records with current information on immunization, lab test results and follow-up information.

Besides the name, date of birth and gender the hospital at birth is often used to link records. As in the previous examples it is critical to not have mismatches, so hand matching is used when there is an ambiguous computer match.

The fourth matching example is for statistical research purposes. Some states link sibling birth records to a mother to understand the behavior and health changes for all pregnancies of a woman. Other linkages are done for program evaluation purposes. For example, many states have linked birth and WIC records. Usually such linkage activities do not require 100% matching and it is less important to prevent mismatches. Probabilistic matching algorithms may be used for this purpose.

In conclusion matching of birth, death, service and patient records are an important part of public health activities. In some cases it is important to link 100% of the records with no mismatches. In other cases such a high degree of precision is not essential. The matching is usually done both by computer algorithm and through visual matching.