

RECORDS, RECORD KEEPING, AND DATA COLLECTION

by

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Abstract

Some aspects of record keeping and data collection are discussed with emphasis on the "why, what, where, when, how, and who" considerations.

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## 1. Introduction

Records refer to a description of some event or phenomenon. For example, November 3<sup>rd</sup> is the birthday of one of the authors. By itself, November 3<sup>rd</sup> is the third day of November. Coupled with the knowledge that it pertains to the birthday of the first author, we have information. This information is a record of the day on which kittens are born. Knowing the day on which a kitten was born allows us to determine the age of the kitten at any future date. A record by itself does not mean that it ever has to be used in the future. A traffic bureau keeps records on many events. Most of the records do nothing but collect dust. In our society we have many, many kinds of records, and we all have a variety of records pertaining to us from the day we were born, and perhaps during our mother's pregnancy, until the day we die and even beyond. Our dentist, our doctor, our church, etc. keeps a variety of records on us. Perhaps, even our superiors keep records on the time we come to work and the time we leave.

The existence of a set of numbers and adjectives in themselves does not imply any information. They must be associated with an event or phenomenon in some manner. For example, white, black, orange, tricolored, etc. are simply adjectives. But when we write that this queen had one white kitten, three black kittens, and one black and white kitten in her litter born on July 1, 1982, this is a record of the color combination of a particular litter.

If we are going to keep records on any particular event, we need to consider the following questions carefully:

- (i) On what event or phenomenon should we keep records? What purpose will be served by keeping these records?
- (ii) What records are to be kept?
- (iii) Why should we keep these records? Are they available elsewhere? Are we keeping more than one set of records on the same event?
- (iv) When are the records to be taken?

- (v) How are the records to be taken?
- (vi) Where are the records to be taken? Where are they to be kept?
- (vii) Who is to take and record the records?

With regard to (i) above, record keeping just to keep records and to keep us busy has no usefulness. We all have better things to do with our time than just to keep ourselves busy with record keeping. We need to ask ourselves what particular phenomenon or event needs to be recorded. We must determine what records are to be kept. We should have a purpose for keeping each record. We should not record every event with the idea that it "might be useful some day". To illustrate the purpose, we must also consider the second aspect of record keeping as to what records are to be kept. Suppose that we decide we want to keep records on food and water consumption in our cattery. We need to ask why. Couldn't we simply buy another bag of cat food every time we ran out and couldn't we simply fill the dishes with water whenever they were empty? We decide this is not sufficient because we want to deduct the cost of the food and water from our income tax on the income derived from our cattery. To do this, we need some sort of records. What records?

- (i) Should we keep a total of all cat food purchased for one year?
- (ii) Should we keep a record for one month and multiply by 12?
- (iii) Should we carefully weigh the amount of food each cat is given and then weigh the amount not eaten to determine how much cat food is consumed each day by each cat?
- (iv) To measure the amount of water used by our cattery, should we measure the amount used for one week by the cats, for washing the cats, and for cleaning the cattery, and then multiply by 52 to obtain yearly usage?

Certainly, (i) or (ii) and (iv) would suffice for income tax purposes. But, we had to allocate water usage for cats, for washing the cats, and for cleaning the cattery; we would need to keep records for each of these uses.

If our purpose was to measure variation among cats in food consumption by individual cats, we would have to follow (iii) for as long as one month. Perhaps a week would suffice, but our cats would all have to be healthy and feeling "normal"

in order for our period of observation to be representative of the cats' food consumption. We would also need to determine if one cat wasted more food than another by scattering the food around, whereas another cat might be a neat eater and spill nothing. For income tax purposes only, one should not follow (iii) because of the time required, and because of the volume of records being accumulated.

In taking weights of kittens and cats, we should note that we may need to weigh kittens every 12 hours when they are very young. There is a saying that if a kitten loses weight for three days there is little hope that it will survive. Some catteries weigh kittens every 12 hours, and if they lose weight on three successive weighings, it is decided that medical treatment is indicated. When kittens become older weekly weights may suffice. As the cat reaches maturity monthly weights may be all that is required. If the older cats appear to be losing weight or are not eating, then the frequency of weighing may be increased. The frequency of taking records is dictated by the circumstances.

Suppose that one selected procedure (ii) and (iv) above. The month selected and the week selected would have to be representative or else one could be in trouble with the IRS. Should we be investigated, we would need to convince the IRS that our time periods were indeed representative of the entire year. If we were in the habit of purchasing a six-month supply of food in March and in September of each year, we could not use those months' purchases and multiply by 12. Instead, we would have to use both, or use one and multiply by two. Whenever a sample of records rather than all records (a census) is kept, we must assure ourselves, and others, of the representativeness of the sample.

Once we decide upon what records and our purpose for keeping records, we should determine if these records are available elsewhere. For example, the Cornell Feline Health Center might have records on daily consumption of food and water by cats of various ages and breeds. However, they may not; and also, their results might not be applicable to our cattery. This means that we would need to obtain this information. All too often, people obtain information that is already available elsewhere. They also obtain duplicate, triplicate, and even more records on the same item. How many years do we furnish IRS with information already available? We put our social security number on every page of our form, on our check, and in a space provided for it on the front page. It also is on the mailing label. We know they have it on the mailing label. Why do we need to record it so many

times? Have you ever had anyone doing interviewing, ask you what sex you were? If they are too dumb to tell, they are too dumb to use the information. Our local veterinarian may have information of the type we desire, which would eliminate the necessity of us keeping records on a particular phenomenon or event. If the records we want are not available, then we will need to obtain them. We should, however, make certain that we do not record an event more than once. We do not need the day a kitten was born recorded in more than one place.

Once we have decided that we want a certain type of record and that it is not available elsewhere, it means that we will have to obtain that record. One of the first items to consider once the "go" decision has been reached, is when are the records to be taken. For example, in recording the birth date of a kitten, will we record it on the day the kitten was born or will we wait until the end of the year and write down the birth dates of all kittens as we remember them? In obtaining weights of kittens as they are growing to maturity, will we take weights at specified ages or whenever the scales are available and the mood strikes us? Will we weigh the kittens before or after they have eaten, or some of each? The type of record keeping operation will bring up various questions about the time the records are to be recorded. If there is no time that can be specified to keep the records, this should be determined before the record keeping starts, and the project of keeping these records abandoned because they will not be obtained. Once the record keeping operation starts, it should be completed according to the prearranged schedule.

Another aspect, already mentioned above, is how the records are to be obtained. If we are, for example, to take weekly weights of growing kittens we must decide if weights are to be recorded in kilograms or grams, ounces or pounds, and what scale is to be used. The scale will need to be standardized to ascertain that correct weights are being obtained. All aspects of how records are obtained should be standardized, and the same procedure used to obtain all records. The how of record keeping should not be haphazard, but should be systematic and standardized.

Another important aspect of record keeping is where are records to be taken and where are they to be kept. In many investigations and activities requiring records it will be obvious where the records are to be taken, but in others it needs to be specified. For example, if we wish kitten weights and have no scales

but must use a neighbor's scales, will we take the kittens with us to be weighed or will we bring the scales to our cattery to use in weighing the kittens? If our record keeping is cooperative with a number of catteries we need to decide where the records will be taken.

Finally, we must decide who is to keep the records. Without someone being given the definite responsibility, records may be omitted, and the whole result ends up in a haphazard manner with many records being omitted. We cannot assume that someone else will keep the record just because we thought they would. We can't "let George do it" if we expect to have a complete set of records. The aspect of where records are to be kept is considered in the next section.

From the above, it should be obvious that failure at any step can result in records being omitted, and we end up with an incomplete set. The old adage "a chain is no stronger than its weakest link" certainly holds here. Failure at any step can doom record keeping. Many of us have had good resolves and intentions about keeping records on various events, activities, or phenomenon, but we failed on one or more of the above aspects and our record keeping ground to a dead halt. If the resolve or need is strong enough, our record keeping will continue. Most of us keep records of checks written in order to know our bank balance. If we don't, dire consequences may result. We are forced to keep this record. We also know that the benefits of record keeping can be substantial, but we must be convinced of the need before our record keeping process will be successful.

## 2. Record Keeping

In order to keep records, some form of recording the records must be followed; some of these are:

- (i) Keep them in your head, and trust that your memory is sufficient to recall records when needed.
- (ii) Write down a record on a scrap of paper which is filed in a pocket, a pocketbook, a drawer, or a place for bits and pieces of paper.
- (iii) Obtain a spiral notebook, bound notebook or a loose leaf note book which is kept in a convenient and safe place.
- (iv) Use cards and a card file for the records.

Too many of us use (i). How many of us write down the birthdates of all of our nearest relatives and friends on 3" X 5" cards with other relevant information? We could do this and keep the next birthday face up on the cards so we won't forget to send a card or call. This method is not sufficient for business records, for income tax records, or for most any other kind of record keeping we can visualize. The human mind is fallible, and not to be trusted.

The keeping of records on scraps and bits of paper may work, but it is not a pleasant, efficient, or convenient method when we want to accumulate information like, for example, the amount of cat food purchased during a year. Of course, many of us have a box or manila envelope for our sales slips, and this is the only record we have. We often have missing sales slips which makes our records incomplete. Writing records on scraps of paper can often result in the record being illegible and unreadable. This brings up the point that numbers, names, adjectives, and other descriptions must be recorded clearly and legibly. They must be recorded in such a manner that they cannot be erased or damaged easily, thus making them illegible. In some cases, it may be desirable to record the records in permanent ink, while in other cases a ball-point pen or pencil may be sufficient. In any case, the records should be readable when the information is required at some future date.

It is highly recommended that some type of notebook be used for record keeping. Sometimes a loose leaf notebook can be utilized, but remember that pages can easily be removed. This may be desirable, but it may be undesirable if the records could be lost. The type of operation that is being served by a particular set of records will quite often dictate or guide the form on which records are kept and manner in which the records are entered in the notebook. In keeping business records, it may be highly desirable and efficient to use a form which will facilitate completion of income tax forms. Various expenditures are tax deductible. The headings of our record sheets could be those which can be used for tax deductions. Then, if there are non-tax deductible items, they can be recorded in other columns. The intermingling of these records can make income tax completions rather difficult. However, if the appropriate column headings are set up in our notebooks, and if we religiously keep these records and summarize them each month, income tax calculations can be greatly facilitated.

In scientific work, it is extremely important to have recorded legibly, systematically, and permanently the information obtained from the investigation. Once the investigation has been completed, there is no way of recapturing lost information or information that should have been obtained. It is advisable to have space to record unusual events, especially in scientific investigations. By leaving space, the investigator is also alerted to the fact that he or she should be on the look-out for unusual and unsuspected events. Even in keeping cattery records, an unusual event may mean that there is disease present, and we had better take the necessary precautions.

### 3. Data Collection

A forthcoming Encyclopedia of Statistical Sciences contains an article by the second author on this topic. Now a datum (singular, data plural) is a record, but a record is not always a datum. A datum is defined to be a fact from which a conclusion may be drawn. A datum is a record that is used to imply something whereas a record is a fact that may or may not be used. Data obtained from scientific investigations, such as those conducted by the Cornell Feline Health Center, and by many other units at Cornell University, are to be used to draw conclusions about the goals and objectives for which the investigation was conducted. For example, suppose that a medical procedure has been proposed for treatment of a certain virus in cats. In order to ascertain if the treatment will work, we set up an investigation on cats which are representative of cats having the virus and are kept under conditions similar to those in catteries. The investigator follows all the steps described above for taking and keeping records (data). When the investigation is completed the data are summarized and interpreted. The investigator then draws a conclusion from the data on how well the treatment works on this virus in cats. He may also notice if the drug affects other viruses or if there are any side effects from using the drug.

Whether one uses the term record and/or datum is immaterial. What is important is that the records are meaningful, clear, and informative about the phenomenon involved. By following the above steps or some similar procedure, the chance of obtaining good records is greatly increased. The records should not be contaminated by other effects. In the above example the investigator might be using cats that had a deficiency in their diets during the experiment. When the

cats were put in the experiment they had no diet deficiencies. Now is the fact of the virus being cured caused by the drug or the diet? One cannot tell unless the investigation has been planned so that effects are not mixed up with other effects such as described above for the drug and diet. Complete accurate record keeping and planning can alleviate these problems.

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