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Topic (iv) Managing revisions and version control to maintain credibility

HOW TO USE MISTAKES TO IMPROVE CREDIBILITY

Invited Paper

Submitted by Statistics Denmark¹

I. INTRODUCTION

1. I am aware that the title of this paper may sound provocative to the average statistician, bearing in mind that statistical errors and the publishing of wrong figures are regarded as a serious threat to the credibility of a statistical institution. How could such occurrences possibly contribute positively to credibility?
2. In Statistics Denmark we have considered the nature of statistical errors and as a result introduced a new policy on handling errors. This is partly a result of an unfortunate experience last year, when we received criticism in connection with the publication of corrected figures. Some major users argued that our website should be used much faster and more actively to inform of the problem. We judged that the criticism was deserved and decided to improve matters.
3. In this paper I will only deal with “real” errors, that is the publishing of wrong figures as a result of miscalculations, sloppy proof reading or other methodological mistakes on the part of the statistical institution. Euphemistically, this is often referred to by statisticians as “unscheduled revisions”. Hence, I shall not deal with the scheduled publishing of revisions or updates to previously published figures – a practice with its own credibility problems.
4. All statistical institutions make mistakes from time to time, but understandably they are not eager to admit it. In my seven years of acquaintance with statisticians I have met three standard reactions when it comes to correcting erroneous figures:
 - “Is this really necessary?”
 - “Do we have to publish it so visibly?”
 - “I would rather just call it an update”

II. THE PROBLEM WITH ERRORS

A. Knowledge is not gathered systematically

5. As a result of the tendency to suppress information on errors, knowledge of the occurrence of errors in statistics is generally not gathered systematically. We know very little about the causes of errors, how often they occur and under what circumstances. This has two consequences:

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6. Firstly, we lack the information necessary to learn from our mistakes. Information on the causes and conditions of errors is not spread in the organization for everybody to learn from, but kept on a local basis, at best. Similarly, I have not yet found a session on errors at an international statistical meeting where national statistical institutions can exchange experience on the causes of errors.

7. Secondly, we are not able to declare the quality of our statistical product on its most important parameter, namely correctness or reliability. We inform users of the release date, sample size and confidence limits of our statistics, but not of the – hopefully slim – risk that the statistics may simply be wrong by mistake.

B. Hiding mistakes puts credibility at risk

8. Statistical institutions may hide mistakes in various ways, ranging from simply never admitting to mistakes to the clever publishing of “revised” or “updated” figures in distant parts of the website. Whatever way is used, the credibility of the institution is put at risk, and there is a very simple reason for this.

9. Wherever human beings are active, mistakes are committed. This simple experience is shared by all human beings. Hence, if a statistical institution never admits to publishing errors, it has a problem with credibility in the eyes of the users.

10. The consequences for credibility may be even worse if you are caught in the act of trying to disguise an error as a “revision” or “update”, or if you just try to correct formerly published figures without telling your users about it.

11. My conclusion is that you really have no choice but to make mistakes visible, both to the users and the general public and internally in the organization. A mistake should be seen as an opportunity for the institution to demonstrate that errors are taken seriously, corrected at the earliest opportunity and corrected figures displayed very visibly to the users.

III. MAKING MISTAKES VISIBLE

C. Gathering information on errors

12. The great advantage of making errors visible internally in the organization is that it becomes possible to gather systematic information on the phenomenon – and to produce internal statistics on errors.

13. As every statistician knows, in order to make statistics you have to start with a classification. To make internal statistics on errors, you first have to classify errors according to their seriousness in the view of the users.

14. Secondly, you got to have reliable data. However, the data providers – in this instance the statisticians – are not inclined to report unbiased on their mistakes. Hence, you have to invent a way of gathering information that gets around this problem of reliability.

15. Finally, you have to publish the results, both internally in order to improve quality procedures and reduce the occurrence of errors, and externally to the users, so that they can get a true picture of the – hopefully slight – probability of your figures being wrong.

D. Publishing errors loud and clear

16. Publishing corrected figures is a task not different from other communication tasks. Firstly, you have to identify the target group – that is, the users most likely to have been misled by the erroneous figures. Secondly, you have to choose the channel or media most likely to reach precisely these users.

17. In the case of subscribed statistical information, the task may be fairly easy – you know exactly who have received the wrong figures and can forward an e-mail, a corrected publication or a corrected fact sheet to precisely these people with an explanation of the nature of the error.

18. It is much more difficult when you do not know exactly who has had the possibility of being misled – the erroneous figures may for example have been published to a broad audience on your website. In this case you have no choice but to announce the error and the correct figures very loud and clear on your website.

19. The purpose of this is twofold: Firstly, the users who have in fact been misled by the error will receive a good service. Their confidence in you will increase as they will expect to be told again if an error should occur another time. Secondly, the users not affected by the error will notice that you are announcing mistakes loud and clear. Their confidence in you will increase as well, as they can see that you are not hiding mistakes.

20. Of course this is only true to a certain extent. The error in itself and the public correction of the error does not add to the credibility of the institution. On the contrary, it may cause criticism from affected users in the short run. And if the number of admitted errors is very high, the credibility of the statistical institution will certainly be negatively affected - deservedly so! But in the long run, an error from time to time - which is corrected loud and clear - will increase the users' confidence that your statistics are usually or almost always trustworthy.

IV. A POLICY ON ERRORS AND MISTAKES

E. The classification of errors

21. In Statistics Denmark's new policy on the handling of errors, an error is defined as an incident creating a need to correct previously published statistics, without this being planned from the outset. We categorize errors in three groups:

- Blemishes
- Minor errors
- Serious errors

22. Blemishes are defined as errors not interfering with the basic understanding or use of the statistics by the users. Examples may be spelling errors or errors in dates or links. Errors in statistical figures can never just be blemishes.

23. Minor errors are defined as errors in statistical figures where it is unlikely that the users are misled, or where only minor groups of users are at risk of being misled. When judging this we take into consideration where in the statistics the error occurs – in the main conclusion or in a secondary table – whether the error is more or less obvious to the normal user, and at what time new and correct figures are scheduled to be published.

24. Serious errors are defined as errors where there is a real possibility that not insignificant groups of users are misled. The classification of errors as minor or serious is always discussed between the Dissemination Centre and the relevant statistical department. Decision on the matter is taken in agreement between the head of dissemination, the head of the relevant statistical department and the relevant director.

F. Policy for dealing with errors

25. Statistics Denmark's policy for dealing with errors came in force in March 2006. The policy deals with errors in statistics, defined as errors in published statistics, both printed publications and pdf-publications on the website. At the moment we publish electronically only in pdf-format, and all paper

publications are available in pdf-format on the website. For the time being our online databank Statbank.dk is exempted from the policy, but we expect to include it at a later stage.

a. Blemishes

26. Blemishes are only corrected online and no action is taken for printed versions of publications. When a blemish is discovered, it is reported to the Dissemination Centre, and we will correct the pdf-version as fast as possible, usually immediately. No mention is made in the publication of the correction.

b. Minor errors

27. Minor errors are corrected – again as fast as possible – in the pdf-version on the website. A note is made where changes have been made in the statistics saying “Corrected compared to the original version”. The date and time of the correction is stated underneath the original date of publication of the statistics – in the case of books in the colophon. The date and time of the correction is also stated in the list of published statistics on the website but no action is taken to actively forward information on the correction or the corrected version itself to known users, subscribers, etc.

28. No action is taken either as to the printed versions already distributed to users. In our major publications, however, it is clearly stated in the preface that if errors are discovered, a corrected version may be found at a specific web address. In the case of minor errors we normally do not alert potential users, but based on a concrete judgement, certain potential users may be alerted and have the corrected version forwarded, for example news agencies or professional users.

29. The balanced reaction to minor errors is due to the fact that by definition users are unlikely to be misled by minor errors. The need for correcting the error has to be held up against the wish not to disturb users unnecessarily with corrections not relevant to them.

c. Serious errors

30. If it is decided that an error is serious, the publication in question – most likely a news release – is immediately removed from the website. It is substituted by a message that an error has been found and the time when a corrected version may be expected. The chief statistician will be informed of the incident straight away.

31. Subsequently, the relevant statistical division and the Dissemination Centre produce a corrected version of the news release. The corrected publication is a complete copy of the original publication but it includes a short introductory paragraph on the error and how the error affects the statistics. The date and time of the correction is stated below the original date of publication. The headline will state that it is a corrected version, and the date and time of the correction is stated in the list of news releases on the website.

32. As fast as possible, a short note on the error and the time when a corrected version may be expected is placed at the front of our website, directly under the day's news releases. From here we link to the corrected publication when this is ready. This note remains on the front of our website for at least one full working day – sometimes longer.

33. All known subscribers to the erroneous news release will be told of the error and will get a copy of the corrected publication. An e-mail with similar content is forwarded to all major news media and news agencies and to a group of known analysts. The e-mail will contain a copy of the corrected news release if it is ready – but if it is not, we inform of the character of the error and the probable time of correction.

34. If a serious error is found in other statistical publications than news releases basically the same procedure is followed. If the error is confined to a minor part of a large publication, we may choose not to forward a reprint of the whole publication but only of the relevant pages. From case to case, we consider whether it is necessary to place a note of the error on the front of our website. If we are able to reach most of the users by other means, we may choose not to.

G. A system for collecting information on errors

35. A system has been developed in Statistics Denmark that systematically collects information on the number and nature of errors and makes the errors visible internally in the organization. The system consists of a reporting module on our intranet where the following information has to be given:

- Type of statistical publication at fault
- Seriousness of the error (blemish, minor or serious error)
- When was the error discovered and by whom?
- Type of error and responsibility (error in links, dates, calculations, dissemination or other types)
- Cause(s) of error
- When was the error corrected?
- Actions taken to correct the error (correction online, reprint, e-mail and so on)
- Actions taken to prevent future errors

36. The reporting of errors is the responsibility of our news release editor, to whom all discovered errors have to be reported immediately. The editor fills in the reporting form on the intranet when causes and consequences of the error are known and after consultation with the statistical department responsible for the statistics in question.

37. The uploading of the intranet reporting form causes a database to be updated with information on the error. At the same time, an internal e-mail is generated with information on the error. This e-mail is automatically forwarded to the relevant statistical department, to the editorial staff of our news releases, to the Head of Dissemination and to the Management, including the chief statistician.

38. In most cases, the errors are caused by the statistical division, but the Dissemination Centre may also be at fault. In theory, our news release editor may be tempted to conceal a possible responsibility by her or by the Dissemination Centre, but this would quickly be discovered due to the transparency of the whole process. The classification of errors and placing of responsibility may be changed by the chief statistician, which has happened once.

H. Measuring errors against a standard

39. When we implemented the new policy on the handling of errors, we had no idea of the magnitude of the problem. An investigation into last year's news releases seemed to indicate that there were serious errors in less than 1 pct. of the publications, but we had no information on minor errors or blemishes.

40. We decided that blemishes were not important to the users. What users needed was a standard for errors – serious and minor errors combined. With some hesitation we wrote into our latest "Strategy 2010" from January this year that in 2010 we aim to have reduced the occurrence of errors (total for serious and minor errors) to 1 pct. of our statistical publications, defined as news releases and Statistical News, both appearing in approximately 500 issues a year.

41. For the year 2006 we aim to find errors in not more than 1.5 pct. of our publications, which amounts to a maximum of 15 errors (total for serious and minor) for the whole institution. This is written into the internal contracts between the chief statistician and the statistical directors. According to their share of the total publication, each director is "allowed" a small number of errors in 2006.

42. By the end of July this year we had recorded 19 blemishes, 5 minor errors and 7 serious errors. If this figure can be projected into the whole year of 2006, we will end up with 33 blemishes, 9 minor errors

and 12 serious errors – well short of our target of a total of 15 errors (serious and minor). In round figures we seem to have blemishes in 3 per cent of our publications and errors in 2 per cent of them.

43. It is too early to conclude on the causes of errors, but of the 12 errors to date, 4 were caused by a change in methodology not thoroughly carried through in all steps of the process, and 3 were caused by faulty data deliveries from companies in the tourist industry. Among the blemishes, common problems were faulty links and old dates carried over from earlier versions of the statistics.

44. Measuring errors in Statistics Denmark has certainly increased the focus of staff members on errors and how to avoid them. Nevertheless it will take a lot of effort to reduce the occurrence of errors in our publications from 2 per cent now to 1 per cent in 2010. Making the errors visible is an important first step.

V. FUTURE DEVELOPMENTS

45. An error in a statistical publication may or may not be accompanied by a similar error in our online databank Statbank.dk, where all statistics in principle must be published at the same time as in the publications. We have developed a similar tool for registering errors in our online databank as is used for publications, and we use this for gathering information on the occurrence and cause of errors in databanks. Preliminary experiences suggest that the causes are often different from publications.

46. For the time being, our online databank is not included in our policy and standard for errors. When more experience has been gained, we plan to set a similar standard for errors in databanks as for errors in publications.

47. The purpose of error control is in the end of course to strengthen the credibility of the institution. As I said at the Henley-Workshop in February 2005 (WP 5), Statistics Denmark has been monitoring our reputation – including credibility – systematically since 2000. This is done through the so-called “Citizen Survey”.

48. In order to further improve the monitoring of our credibility, a new question on this subject will be added in this autumn’s Citizen Survey. In addition, credibility will be the subject of a new inquiry among registered users of Statbank.dk and among news media journalists. It is our hope that the new policy on dealing with errors will contribute to further improving the image of the organization in the long run.