Trachoma survey methods: a literature review

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Abstract Reliable population-based prevalence data are essential for planning, monitoring and evaluating trachoma control programmes and understanding the scale of the problem, yet they are not currently available for 22 out of 56 trachoma-endemic countries. Three survey methods have been advocated for trachoma: cluster random sampling (CRS); trachoma rapid assessment (TRA); and acceptance sampling trachoma rapid assessment (ASTRA). Our review highlights the benefits of CRS being simple, efficient, repeatable and giving population-based prevalence estimates of all signs of trachoma. There are limitations to TRA, which include: non-representative sampling; does not estimate prevalence; and lacks consistency and accuracy. ASTRA advocates small sample sizes but it is relatively complex, may result in imprecise prevalence estimates and does not estimate cicatricial signs of trachoma. We conclude that CRS should therefore remain the "gold" standard for trachoma surveys. However, among the CRS surveys reviewed, we also found several methodological deficiencies of sample-size calculations, standardization of trachoma graders, reporting of confidence intervals of prevalence estimates, variability of age groups for presentation of age-specific prevalence, and lack of estimation of district prevalence estimates. Properly conducted surveys will be crucial if the objective of global elimination of blinding trachoma is to be charted and realized. Harmonization of survey methods will enhance the conduct and comparability of trachoma surveys needed for reliable mapping of prevalence within endemic countries. Consistent with WHO recommendations, we advocate for continued use of CRS as the survey design of choice for trachoma control programmes and propose ways of improving future surveys based on this method.

Une traduction en français de ce résumé figure à la fin de l'article. *Al final del artículo se facilita una traducción al español.* الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

Introduction

Trachoma surveys are essential in that they provide the fundamental data for quantifying disease burden that facilitates planning, implementation, monitoring and evaluation of trachoma control programmes. Communities with trachoma are largely underprivileged and most frequently located in remote rural areas of developing countries. These communities often present methodological challenges and difficulties in conducting surveys due to: (i) geographical remoteness, (ii) political marginalization, (iii) the lack of an up-to-date population census data, (iv) high rates of migration among nomadic communities or displacement of populations, (v) insecurity and (vi) seasonal inaccessibility due to weather and poor road infrastructure. Methodological and practical obstacles make trachoma surveys demanding and challenging. Therefore, survey designs must be efficient and valid. There is need for trachoma control programmes to have minimum standards for trachoma field surveys based on achieving efficiency (to save time and cost) while at the same maintaining precision (methodological rigour).

WHO's simplified grading system for trachoma, which was introduced in 1987, was a key milestone that enabled auxiliary health workers to undertake trachoma diagnosis[1] and has facilitated fieldwork in trachoma surveys tremendously. WHO recommends planning and implementation of the SAFE (Surgery, Antibiotics, Facial cleanliness and Environmental improvements) strategy based on district trachoma prevalence estimates, where a district is defined as the normal administrative unit for health-care management.[2] However, a recent systematic review by Polack et al.[3] reported inadequacy of reliable trachoma prevalence data and highlighted variations in design, methods and outcomes of reviewed surveys. In addition, the review underscored the need for population-based trachoma prevalence data, which are at present lacking in 22 out of 56 trachoma-endemic countries. Lack of population-based prevalence data and discrepancies in survey methods have implications for comparability of prevalence data between populations and planning of trachoma control programmes and are an impediment to the global trachoma control efforts. We aimed to review trachoma survey methods to identify and recommend survey techniques that will facilitate collection of reliable and consistent data for planning, monitoring and evaluation of trachoma control programmes.

Trachoma survey methods

Population-based prevalence surveys (PBPS)

PBPS are the "gold standard" for estimating the prevalence of trachoma within a target population. The most commonly used population-based survey design for trachoma prevalence estimation is cluster random sampling (CRS).[4] The sample size for CRS is calculated by defining parameters which include: expected prevalence estimates, error margin or precision, confidence level, level of significance and design effect. Design effect describes the relative change in the variance caused by cluster sampling.[5]

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In CRS, non-overlapping subpopulations (clusters) usually based on geographical or political boundaries are selected and then eligible participants are selected within each cluster. Commonly, a two-stage design is used comprising selection of villages (clusters) at the first stage and selection of households at the second. Various sampling methods have been designed for sampling households; but the two most commonly used include the random walk[6] and compact segment sampling, whereby sketch maps are used to randomly select groups of households within cluster.[7] The design can be extended to incorporate multiple stages. Modifications of CRS include use of probability proportional to size (PPS) sampling based on the cluster population. Sampling weights must be used where complex CRS designs are conducted.

CRS is efficient in that only enumeration of the population in the selected cluster is required rather than a complete population census. CRS samples can be used for multiple indicators at the same time, e.g. assessment of active trachoma, trichiasis and community risk factors. The main drawback is that CRS is not intended for calculation of estimates from individual clusters.

Trachoma rapid assessment (TRA)

TRA was developed in 1999 and billed as a simple and efficient method to allow for rapid assessment of active trachoma in children, trichiasis in women and environmental risk factors.[8] This method employs a convenience sample to identify high-risk communities. It is based on community participation and has been advocated to provide a practical way of determining whether or not blinding trachoma is endemic in a given community. TRA has been advocated as an operational tool allowing for ranking of communities thus facilitating prioritization of interventions in worst affected areas. However, TRA is not based on probability sampling and was not designed to estimate prevalence.[9] Although the originators of the technique emphasize that it should never replace proper surveys, TRA data are frequently presented as prevalence estimates. In addition, field trials suggest that the method has low consistency, casting further doubt on its accuracy.[10]

Acceptance sampling trachoma rapid assessment (ASTRA)

ASTRA is based on lot quality-assurance sampling (LQAS) and has been advocated for identifying and classifying communities that have low or high prevalence of trachoma. LQAS originated from the manufacturing industry for quality control purposes and has been used by public health services to evaluate immunization coverage.[11] The main outcome of this methodology is to determine if a batch or lot of goods is "acceptable" or "not acceptable" by taking a sample of items and defining the level of reasonable risks to be taken for not inspecting every item. The decision value is the number of "defective" items that need to be found before a lot is deemed unacceptable. This survey design does not have a fixed sample size and sampling may stop once the number of defects allowed has been exceeded. In a field trial of ASTRA in Malawi in 2003, children aged 2–5 years were examined until a predetermined number of cases of active trachoma were identified or a total of 50 children were sampled without the cut-off point being reached.[12] Although not generally used for overall population estimates, ASTRA can be modified to estimate prevalence whereby sampling in a lot continues until the maximum sample size is met rather than stopping when the expected "defective" units are identified. ASTRA's key advantage is asserted to be in saving time and cost due to relatively small sample sizes. However, the total sample size may be larger than that required for a PBPS if the overall population estimate is required in addition to time spent surveying every lot. The use of a stopping rule is crucial in the functionality of ASTRA; however, the use of small sample sizes results in imprecise estimates.

Table 1 summarizes characteristics of current trachoma survey methods.

Methods

Search strategy

A literature search was performed in January 2007 using PubMed without any language restrictions. Combinations of the following keywords were used to perform multiple searches: trachoma (MeSH), prevalence (MeSH), epidemiology (MeSH), "survey" and "assessment". The search found 374 titles and abstracts from which we listed papers that could possibly describe prevalence surveys of trachoma. Reference lists of retrieved articles were hand-searched to see if any further studies could be found.

Inclusion criteria

The criterion for inclusion of an article in this review was that the article had to describe a primary survey that provided a measure of trachoma signs using the WHO simplified grading scheme.[1] Information on the study setting, population, sample-size estimation, sampling design and key outcomes was extracted. The quality of studies was evaluated and methodological shortfalls identified.

Results

Survey characteristics

The 35 studies included in this review are summarized in Table 2 and a detailed summary of the study characteristics is available at: http://www.cartercenter.org/news/publications/health/trachoma_experts.html. The studies were conducted in 19 countries between 1991 and 2006; 29 were published in English, 5 in French and 1 in Portuguese. The survey types included 25 PBPS, 4 TRA and 3 ASTRA; while 3 studies combined PBPS and TRA designs with the aim of validating TRA against PBPS. District-prevalence estimates were reported in 14 (40%) of the reviewed studies. Three studies were conducted in schools while the rest were carried out in communities. Of the studies reviewed, 8 were supported by WHO of which 6 used the CRS design and 2 used TRA.

Methodological issues

PBPS

A total of 25 PBPS with various designs were reviewed and included: 19 CRS, 4 systematic random samples, 1 whole community census and 1 study that did not report the survey design and the sampling plan. Two PBPS were conducted in schools and 23 in communities. Sample size estimation parameters were reported in 15 (60%) of the PBPS. The reported design effects were 4 and 5 for active trachoma, and 1.5 and 2 for trichiasis. Sampling plans were described in all studies with the exception of 1. Overall, there was wide variability

Table 1. **Summary of characteristics of trachoma survey methods**

Characteristic	PBPS, e.g. CRS	ASTRA	TRA
Sampling design	One or multistage cluster sample	Stratified random sample from population list; modified LQAS	Convenience sample of communities with greatest perceived trachoma burden
Sub-populations	Clusters based on geographical or political boundaries; supposed to be heterogeneous	Lots based on geographical or political boundaries; supposed to be homogenous	Villages or communities
Sample size	Estimate based on a population proportion	Estimate based on hypothesis test (desired proportion and level of Type I and Type II errors)	Fixed sample of 50 children aged 1–9 years
Lists of units	List of primary sampling units needed; complete census not needed, but useful	Population census is essential	No census needed
Basis for inference	Confidence interval for estimate	Hypothesis test	Ranking of communities
Outcome	Overall population estimate (e.g. prevalence); estimate from individual clusters should not be calculated	Individual lots judged as acceptable or not acceptable: overall estimates if stopping rule is not used	Proportions in each village or community
Weighting of sample	Self-weighting if PPS	Weights calculated for each lot if overall estimate is required	Weighting not required
Cost	Decreased travel time and preparation; reduced cost since census not required	Low cost due to small sample sizes claimed; however, the need to sample each lot may yield higher cost for population census	Cheap since sample is convenient
Reasons for potential bias	Geographical clustering of sample	Small samples in each lot	Selection bias
Advantages	Simple and efficient to conduct; population census not required; multiple indicators may be assessed in one survey; periodic surveys allow changes in prevalence to be shown over time; multiple indicator surveys enhance interpretation of prevalence change	Small sample sizes for deciding acceptability of a lot; suitable for small study units; suitable for monitoring programme coverage; periodic surveys allow a "snap decision" on whether to continue or stop intervention	Simple and cheap to conduct.
Disadvantages	Does not derive estimate for individual clusters; error estimates require adjustment for sample design	Population census list essential; expertise required deciding acceptable proportions and risks; small samples in each lot may result in imprecise estimates; large sample sizes if overall estimate is required; cannot be used for multiple indicators	Inaccurate and inconsistent estimates; does not produce prevalence estimates; not based on accurate epidemiological methods; not suitable for monitoring or surveillance
When to use	Interest in overall population estimate; population-based prevalence surveys are the "gold standard"	Interest in information for each lot; suitable for monitoring or surveillance	May identify where prevalence surveys are required; limited use due to inadequate statistical rigour

ASTRA, acceptance sampling trachoma rapid assessment; CRS, cluster random sampling; LQAS, lot quality-assurance sampling; PBPS, population-based prevalence surveys; PPS, probability proportional to size; TRA, trachoma rapid assessment.

in the characterization of geographical/administrative sampling units. In 20% of PBPS, standardization of examiner grading was not reported. Ten (40%) PBPS did not report the confidence intervals of the prevalence estimates and 4 CRS studies did not report adjustment of confidence intervals for clustering. Most studies included children aged less than 10 years; however, the age group was not uniformly reported. In 1 study, age was not measured since this was not considered culturally acceptable. Reporting of prevalence varied between studies with trachomatous inflammation-follicular (TF), trachomatous inflammation-intense (TI) and active trachoma (TF and/or TI) reported in varying combinations. In 21 studies that reported the prevalence of trachomatous trichiasis (TT), age and sex of participants varied with 6 studies only reporting TT prevalence in women.

TRA

Seven studies described TRA design of which 3 were comparisons of TRA against CRS surveys that were conducted in the same villages. These comparison studies were methodologically flawed because CRS design should not be used to calculate estimates for individual clusters.[46] The age of children participants in TRA was uniform and all TRA studies consistently reported active trachoma as an outcome. However, in TRA studies reporting TT, sampling of the participants and ascertainment of cases was not consistent. Two TRA studies did not report standardization of examiners.

Table 2. **Characteristics of studies included in the literature review**

Author, year and reference no.[a]	Country	Survey type	Population/ participants	Sampling plan	Trachoma signs reported[b]	Problems with methods[c]
West et al., 1991[13]	United Republic of Tanzania	PBPS	Community: children 1–7 years and mothers/caregivers	Two stage CRS	Active trachoma, TI, TS, TT, CO	1 and 2
Sukwa et al., 1992[14]	Zambia	PBPS	Community: all ages	Stratified random sampling	TF, TS, TC, TT, CO	1, 2 and 3
Medina et al., 1992[15]	Brazil	PBPS	School: children age 4–11 years	Two stage CRS	Active trachoma	1, 2 and 3
Luna et al., 1992[16]	Brazil	PBPS	Community: children 1–10 years and people ≥ 10 years	Random sample of HHs	TF, TI, active trachoma, TS, TT	3
Négrel et al., 1992[17]	Morocco	PBPS	Community: children < 10 years and women ≥ 15 years	Two stage CRS	Active trachoma, TI, TT	
Katz et al., 1996[18]	Nepal	PBPS	Community: children 2–6 years	Systematic sampling	TF, TI, active trachoma	
Zerihun N, 1997[19]	Ethiopia	PBPS	Community: all ages	Two stage CRS	Active trachoma, TS, TT, CO	1 and 3
Dolin et al., 1998[20]	Gambia	PBPS	Community: all ages	Two stage CRS	Active trachoma, TS, TT, CO	1 and 3
Schémann et al., 1998[21]	Mali	PBPS	Community: children 0–10 years and women > 14 years	Two stage CRS	Active trachoma, TI, TT	
Schémann et al., 2000[22]	Mali	TRA	Community: children < 10 years	Villages, then children in HHs	Active trachoma	
Alene et al., 2000[23]	Ethiopia	PBPS	Community: all ages	Full community census	Active trachoma	1 and 3
Limburg et al., 2001[10]	Gambia	TRA	Community: children 1–10 years	Villages, then children in HHs	Active trachoma	
Ezz al Arab et al., 2001[24]	Egypt	PBPS	Community: children 2–6 years and adults > 50 years	Two stage CRS	TF, TI, active trachoma, TT	
Assefa et al., 2001[25]	Ethiopia	TRA	Community: all ages	Villages, then people in HHs	Active trachoma, TT	2
Bejiga et al., 2001[26]	Ethiopia	PBPS	Community: all ages	Two stage CRS	TF, TI, TT	4
Rabiu et al., 2001[27]	Nigeria	PBPS	Community: children 1–9 years	Two stage CRS	Active trachoma	1
		TRA	Community: children 1–9 years	Villages, then children within HHs	Active trachoma	
Lansingh et al., 2001[28]	Australia	PBPS	Community: all ages	Full community census	Active trachoma	2
Paxton et al., 2001[29]	United Republic of Tanzania	PBPS	Community: children 1–10 years and women > 15 years	Two stage CRS	Active trachoma, TI, TT	1
		TRA	Community: children 1–10 years and women > 15 years	Villages then children within HHs	Active trachoma, TT	
Alves et al., 2001[30]	Brazil	PBPS	Community: all ages	Sampling method not described	Active trachoma, TS, TT	1, 2 and 3
Liu et al., 2002[31]	China	PBPS	Community: children aged 1–10 years	Two stage CRS	Active trachoma, TT	1 and 3
		TRA	Community: children 1–10 years	Villages then children within HHs	Active trachoma	
Medina et al., 2002[32]	Brazil	PBPS	School: children aged 4–11 years	Stratified systematic sampling	TF, TI	
Schémann et al., 2003[33]	Burkina Faso	PBPS	Community: children < 10 years	Two stage CRS	Active trachoma	2 and 4

(Table 2, cont.)

Author, year and reference no.[a]	Country	Survey type	Population/ participants	Sampling plan	Trachoma signs reported[b]	Problems with methods[c]
Saal et al., 2003[34]	Senegal	PBPS	Community: children < 10 years and women age > 14 years	Two stage CRS	Active trachoma, TI, TT	
Wondimu et al., 2003[35]	Ethiopia	PBPS	Community: all ages	Two stage CRS	TT	4
Madani et al., 2003[36]	Chad	PBPS	Community: children < 10 years and women > 14 years	Two stage CRS	TF, TI, TT	
Myatt et al., 2003[12]	Malawi	ASTRA	Community: children 2–5 years	Selection of HHs by compact segment method	Active trachoma	2
Regassa et al., 2004[37]	Ethiopia	PBPS	Community: adults > 15 years	Three stage CRS	TF, TI, active trachoma, TS, TT, CO	2 and 4
Cumberland et al., 2005[38]	Ethiopia	PBPS	Community: children 3–9 years	Two stage CRS	TF, TI, active trachoma	1 and 3
Myatt et al., 2005[39]	Viet Nam	ASTRA	School: children 6–11 years	Systematic sampling	Active trachoma	2
Ngondi et al., 2005[40]	Sudan	PBPS	Community: children 1–9 years and adults ≥ 15 years	Two stage CRS	TF, TI, active trachoma, TS, TT, CO	
Faye et al., 2005[41]	Senegal	ASTRA	Community: children 2–5 years and adults > 40 years	Two stage CRS	TF only, TF+TI, TI only	2
Khandekar et al., 2006[42]	Viet Nam	PBPS	Community: adults ≥ 35 years	Two stage CRS	TS, TT, TCO	4
Al-Khatib et al., 2006[43]	Yemen	TRA	Community: children 1–9 years	Villages, then people within HHs	Active trachoma, TT cases	2
Karimurio et al., 2006[44]	Kenya	PBPS	Community: children 1–9 years and adults ≥15 years	Two stage CRS	TF, TT	4
Ngondi et al., 2006[45]	Sudan	PBPS	Community: children 1–9 years and adults ≥ 15 years	Two stage CRS	TF, TI, active trachoma, TS, TT, CO	

ASTRA, acceptance sampling trachoma rapid assessment; CRS, cluster random survey; CO, corneal opacity; LQAS, lot quality-assurance sampling; HHs, households; PBPS, population-based prevalence survey; TF, trachomatous inflammation-follicular; TI, trachomatous inflammation-intense; TRA, trachoma rapid assessment; TS, trachomatous scarring; TT, trachomatous trichiasis.

[a] Detailed summary of studies reviewed available from: http://www.cartercenter.org/news/publications/health/trachoma_experts.html

[b] Active trachoma defined as TF and/or TI.

[c] Problems with methods: (1) sample size calculation parameters not given, (2) examiner reliability not reported, (3) confidence intervals of prevalence estimates not reported and (4) adjustment for clustering of trachoma not reported.

ASTRA

Three studies described the ASTRA design, of which 1 was a trial on its applicability. One study reported use of the ASTRA design; however, the design described was analogous to CRS. All 3 ASTRA studies used a consistent outcome of active trachoma; however, none of the studies reported standardization of examiners. Two ASTRA surveys that were community based studied children aged 2–5 years whereas 1 school-based study surveyed children aged 6–11 years.

Discussion

Trachoma surveys are essential for quantifying disease prevalence to facilitate programme planning, implementation, monitoring and evaluation. Population-based prevalence surveys are the "gold standard" for estimating prevalence of trachoma in populations.[47] Use of rapid assessment techniques (TRA and ASTRA) have been suggested as a cost-effective way of prioritizing communities for interventions. However, the costs of conducting surveys are not routinely reported and there is no pragmatic evidence in the public domain on cost-effectiveness of the different survey methods. While there is a need for further studies on survey costs, rapid assessment techniques cannot possibly replace the role of PBPS, especially in trachoma control.

Evaluation of published PBPS revealed several omissions and important methodological issues were noted: (i) half of the reviewed studies did not report sample size estimation, (ii) one-fifth of the studies did not report standardization of trachoma grading among examiners, (iii) two-thirds of the studies did not report confidence intervals of the prevalence estimates, (iv) variability in reporting of trachoma signs surveyed, (v) variability in age grouping of participants and (vi) inconsistency of reporting district-level prevalence estimates.

This review also highlights limitations of rapid assessment methods. TRA is of limited use since it is not based on statistically sound design and does not derive prevalence estimates. Additionally, field trials suggests that the method has low consistency, casting further doubt on its accuracy.[11]

ASTRA, on the other hand, is not practical in settings where up-to-date population census data are not available to generate a stratified random sample. Another drawback is that ASTRA recommends sampling children aged 2–5 years and thus does not comply with the WHO guidelines of estimating active trachoma prevalence in children aged 1–9 years.[2] In addition, ASTRA does not include measurement of cicatricial signs (trachomatous scarring, TT and corneal opacity) and is therefore of limited use in assessing the complete disease burden due to blinding trachoma.

Less than half of the reviewed studies reported district-level prevalence estimates and the majority of these surveys covered only a single district. WHO recommends planning and implementation of the SAFE strategy based on district prevalence estimates and defines a district as the normal administrative unit for healthcare management.[2] However, the term district is applied in different ways in various countries, therefore province-level or regional-level estimates may be what was actually reported for some countries.

Several surveys studied schoolchildren. School-based surveys are rapid and can be valuable in identifying areas with trachoma. However, school-based surveys are believed to underestimate prevalence of trachoma in the community as a whole since children attending school in underserved communities largely come from households with higher socioeconomic status and therefore have a markedly lower risk of disease compared to children not attending school.[48,49] Nonetheless, when found, a high prevalence of active trachoma in schoolchildren is a useful indicator of significant disease in the community. Certainly, the absence of active trachoma in schoolchildren does not preclude trachoma in the community.

In most surveys, examination of participants took place at home while, in 3 studies, examination was conducted at a central site. Paxton et al. observed that, in the United Republic of Tanzania, better response rates were achieved when examination was done at home compared to a central site.[29] Examination at a central site is likely to result in overestimation, especially of TT and corneal opacity, since people with these grades are more likely to attend for examination with the expectation of treatment being offered. People not attending for examination at a central site are likely to be normal thus resulting in selection bias and overestimation of prevalence.

Conclusion and recommendations

Properly conducted surveys are crucial if the objective of global elimination of blinding trachoma by the year 2020 is to be chartered and realized. WHO currently advocates use of CRS design for trachoma surveys. Therefore, harmonization and consistency of survey methods will enhance conduct of trachoma surveys to facilitate rational programme planning and equitable prioritization at the global level and within national programmes. Uniformity of methods will also simplify reporting at international level thus allowing for comparable progress reports to be made.

Based on this review, we underscore that CRS design is the most reliable survey method for trachoma prevalence estimation and advocate for continued use of this method for trachoma surveys. It is well suited for trachoma-endemic settings where population census data are usually not available. To optimize prevalence results from this method, standardization of the following six methodological issues is proposed.

- *District level estimates:* WHO recommends that decisions about starting trachoma control activities should be based upon district-level prevalence estimates.[2] Therefore the district is the smallest administrative unit for which reliable prevalence estimates are required. While classification of community prevalence has been suggested, this is not essential and is not likely to provide additional information over and above that obtained from district-level prevalence estimates.
- *Sample size estimation and design effect:* Surveys need to clearly outline parameters used in estimating the sample size to enable repeatability of methods. Based on the studies reviewed, design effects of 4–5 for active trachoma and 1.5–2.0 for trichiasis were used in estimation of sample sizes using the CRS design. However, surveys of trachoma should routinely report the design effects of the survey findings to inform design of future surveys.
- *Standardization of examiners:* Evaluation of reliability is essential and must be undertaken before any epidemiological survey on trachoma. The reliability study ensures that the examiners grade trachoma consistently and properly, thus maintaining comparability across surveys and over time.
- *Outcomes of active trachoma signs:* TF has been suggested by WHO as the key indicator for assessing the public health importance of active trachoma.[2] While this facilitates uniformity of reporting inflammatory trachoma, there is a need for trachoma surveys to continue reporting on prevalence of TI separately since it is a more severe sign of active trachoma and appears more susceptible to intervention.
- *Age range of children to be examined:* WHO has suggested inclusion of children aged 1–9 years in estimating prevalence of TF. There is a need to keep this age range uniform since the prevalence of TF is age dependent. Examining different age groups at different time points may result in imprecise estimation of prevalence, especially when only children attending school are sampled.
- *Analysis of point prevalence estimates:* Prevalence surveys need to report the confidence intervals of the prevalence estimates. The sampling design must be taken into account in analysis, particularly for CRS. Use of sampling weights must be considered where complex sampling designs are conducted. ■

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Résumé

Méthodes d'enquête sur le trachome : revue de la littérature

Il est essentiel de disposer de données de prévalence en population fiables pour planifier, surveiller et évaluer les programmes de lutte contre le trachome et appréhender l'ampleur du problème. Cependant, sur les 56 pays où cette maladie est endémique, 22 ne disposent pas de telles données. Trois méthodes d'enquête ont été préconisées pour le trachome : le sondage aléatoire en grappes (CRS) ; l'appréciation rapide du trachome (ART) et l'échantillonnage par lots pour l'assurance de la qualité (ASTRA). Notre étude fait ressortir les avantages de la méthode CRS, à savoir sa simplicité, son efficacité, sa reproductibilité et sa capacité à fournir des estimations de la prévalence en population de tous les signes du trachome. La méthode ART comporte des limitations : en particulier, elle utilise des échantillons non représentatifs, ne fournit pas d'estimation de la prévalence et manque de cohérence et de précision. La méthode ASTRA ne requiert que des échantillons de petite taille, mais présente une certaine complexité, peut conduire à des estimations imprécises de la prévalence et n'évalue pas les signes cicatriciels du trachome. Nous en concluons que la méthode CSR doit rester la méthode de référence pour les enquêtes sur cette maladie. Cependant, parmi les enquêtes utilisant la méthode CRS examinées, nous avons trouvé plusieurs défauts méthodologiques dans le calcul de la taille des échantillons, la standardisation des grades du trachome, l'indication des intervalles de confiance pour les estimations de la prévalence, la variabilité des tranches d'âges pour la présentation de la prévalence par âge et le manque d'estimations de la prévalence à l'échelle du district. Il est indispensable que les enquêtes soient correctement menées si l'on veut se donner comme objectif l'élimination mondiale du trachome et réaliser cet objectif. Une harmonisation des méthodes d'enquête permettrait d'améliorer la conduite et la comparabilité des enquêtes sur le trachome nécessaires à une cartographie fiable de la prévalence de cette maladie dans les pays d'endémie. En accord avec les recommandations de l'OMS, nous préconisons de poursuivre l'application de la CRS comme méthode d'enquête de choix dans les programmes de lutte contre le trachome et nous proposons des moyens pour améliorer les futures enquêtes reposant sur cette méthode.

Resumen

Métodos de encuesta sobre el tracoma: revisión de la bibliografía

La obtención de datos poblacionales fiables sobre la prevalencia es fundamental para planificar, vigilar y evaluar los programas de control del tracoma y determinar la magnitud del problema, pero aún no se dispone de tales datos para 22 de los 56 países con tracoma endémico. Se han propuesto tres métodos para las encuestas sobre el tracoma: muestreo aleatorio por conglomerados (MAC); evaluación rápida del tracoma (ERT); y evaluación rápida del tracoma mediante muestreo de aceptación (ERTMA). Nuestra revisión destaca las ventajas del MAC, por tratarse de un método sencillo, eficiente, reproducible, y que arroja estimaciones poblacionales de la prevalencia de todos los signos de tracoma. La ERT presenta algunas limitaciones, entre ellas que el muestreo no es representativo, que no estima la prevalencia, y que adolece de falta de coherencia y de exactitud. La ERTMA propone tamaños de muestra pequeños pero es relativamente compleja, puede dar lugar a estimaciones de la prevalencia imprecisas y no estima los signos cicatrizales del tracoma. Nuestra conclusión es que el MAC debería seguir siendo por tanto el patrón de referencia en las encuestas sobre el tracoma. Sin embargo, entre las encuestas revisadas basadas en el MAC hemos hallado también varias deficiencias metodológicas en los cálculos del tamaño de la muestra, la normalización de los grados de tracoma, la notificación de los intervalos de confianza de las prevalencias estimadas, la variabilidad de los grupos de edad en las presentaciones de la prevalencia por edades y la falta de estimaciones de la prevalencia por distritos. Es fundamental disponer de unas encuestas rigurosamente realizadas si se desea vigilar los progresos y alcanzar el objetivo de la eliminación mundial del tracoma causante de ceguera. La armonización de los métodos de encuesta facilitará la realización y comparabilidad de las encuestas al respecto que es necesario realizar para mapear fiablemente la prevalencia de la enfermedad en los países endémicos. En coherencia con las recomendaciones de la OMS, proponemos que se siga usando el MAC como diseño encuestal de elección en los programas de control del tracoma y sugerimos alternativas para mejorar las futuras encuestas basadas en ese método.

ملخص

طرق إجراء مسوحات التراخوما: مراجعة للأدبيات

تعد البيانات الموثوقة، السكانية المرتكز، المتعلقة بانتشار التراخوما ضرورية ولازمة لأغراض تخطيط ورصد وتقييم برامج مكافحة التراخوما وتفهم حجم مشكلتها. إلا أن تلك المعلومات غير متوفرة حالياً في 22 بلداً من البلدان الـ 56 الموطونة بالتراخوما. وهناك ثلاث طرق توجّه الدعوة إلى تبنّيها عند إجراء مسوحات التراخوما، وهي: الاعتيان العشوائي العنقودي، والتقييم السريع للتراخوما، واعتيان القبول للتقييم السريع للتراخوما. وتسلط هذه المراجعة الضوء على مزايا طريقة الاعتيان العشوائي العنقودي لكونها بسيطة وفعالة ويمكن تكرارها وتعطي تقديرات انتشار سكانية المرتكز لجميع علامات الإصابة بالتراخوما. وهناك أوجه قصور في طريقة الاعتيان العشوائي العنقودي ومن بينها الاعتيان غير الممثِّل، وأنها لا توفر تقديرات للانتشار، كما أنها تفتقر للثبات والدقة. وبالنسبة لطريقة اعتيان القبول للتقييم السريع للتراخوما، فرغم أنها تعتمد العينات صغيرة الحجم، إلا أنها معقدة نسبياً، وقد تُفضي إلى عمل تقديرات غير دقيقة لانتشار التراخوما، كما أنها لا توفر تقديرات للعلامات الندبية للتراخوما. ويخلص الباحثون إلى أنه ينبغي أن يظل الاعتيان العشوائي العنقودي هو المعيار المرجعي لمسوحات التراخوما. ومع ذلك، فقد وجد الباحثون، من خلال مسوحات الاعتيان العشوائي العنقودي التي روجعت، عدة أوجه قصور منهاجية في ما يتعلق بحسابات حجم العينة، وتقييس مبوِّبات التراخوما، والإبلاغ عن فواصل الثقة لتقديرات الانتشار،

ومتغيريه الفئات العمرية الخاصة باستعلان الانتشار، وعدم وجود تقديرات لحجم الانتشار في المناطق. وتعد المسوحات التي تجرى بصورة صحيحة، حاسمة، إذا ما كان الهدف المرسوم والمتحقق هو التخلص من التراخوما المسببة للعمى، على المستوى العالمي. وإن تحقيق الانسجام بين طرق المسح من شأنه أن يحسن من سبل إجراء وإمكانية المقارنة بين مسوحات التراخوما المطلوبة من أجل التحديد الموثوق لانتشارها داخل البلدان الموطونة. وتمشياً مع توصيات منظمة الصحة العالمية، فإن الباحثين يدعون إلى مواصلة العمل بطريقة الاعتيان العشوائي العنقودي بوصفها الطريقة المفضلة لإجراء المسوحات الخاصة ببرامج مكافحة التراخوما. ويقترح الباحثون سبلا لتحسين المسوحات المستقبلية استناداً إلى هذه الطريقة.

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