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(Review)

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[Intervention Review]

Community animal health services for improving household wealth and health status of low income farmers

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ABSTRACT

Background

Community animal health services in low-income countries aim to improve the health of animals and directly improve the wealth and health or livelihood of their owners. These services have been promoted by aid organizations since the 1970s.

Objectives

To summarize reliable research of community animal health services on indicators for household wealth and health.

Search methods

We searched the Cochrane Infectious Diseases Group Specialized Register (January 2011), CENTRAL (*The Cochrane Library* 2010, Issue 4), MEDLINE (1966 to January 2011), AGRIS (1975 to January 2011), Science Citation Index (2000 to January 2011), STN SIGLE database (1976 to 2011), and AGRICOLA (January 2011). We contacted relevant researchers and organizations, and also checked the reference lists of articles.

Selection criteria

Randomized controlled trials and controlled before-and-after studies comparing community animal health services with no community animal health services or with an alternative animal health service.

Data collection and analysis

We independently assessed studies for inclusion in the review.

Main results

No studies met the inclusion criteria.

Authors' conclusions

Well-designed randomized controlled trials or controlled before-and-after studies that use standard pragmatic outcomes are needed to evaluate the positive results reported by observational studies.

23 April 2019

Update pending

Studies awaiting assessment

The CIDG is currently examining a new search conducted in April 2019 for potentially relevant studies. These studies have not yet been incorporated into this Cochrane Review.

PLAIN LANGUAGE SUMMARY

Community animal health services for improving household wealth and health status of low-income farmers

Livestock are central to the household economy for some communities in low-income and middle-income countries. The availability of basic veterinary services could contribute to the wealth and health of households by preventing animal illness or death. In most low-income countries in Africa, Asia, and Latin America, the state provided free veterinary services during the years in which countries were colonized, and for some time after their independence. However, since the 1960s privately (or self) employed veterinarians are slowly replacing government veterinary services. Privatized veterinary services, modelled on European or North American systems, have had mixed success in that they seem to have worked well in urban areas, but not in remote arid and semi-arid areas of the world, where livestock herding is very extensive and people do not have money to pay for the services. While the provision of community animal health services seems common sense, very few well-designed randomized controlled trials nor any controlled before-and-after studies have evaluated its impact. Such studies are needed to substantiate the positive results reported in several observational studies.

BACKGROUND

Livestock are central to the household economy for some communities in low-income and middle-income countries. The availability of basic veterinary services could contribute to the wealth and health of households by preventing animal illness or death. Since the 1970s, governmental and nongovernmental organizations have provided resources for low-income countries to implement community animal health services. Low-income farmers are defined as farmers earning less than 755 USD per year.

History of community animal health services

In most low-income countries in Africa, Asia, and Latin America, the state provided free veterinary services during the years in which countries were colonized and for some time after their independence (Schillhorn 1995). However, since the 1960s there has been a decrease in public sector funding, which also affected veterinary services (Odeyemi 1994). In the 1980s and 1990s, the World Bank and International Monetary Fund encouraged national governments to privatize a large proportion of state services, including the veterinary services (Leonard 1993). Privately (or self) employed veterinarians replaced the government veterinary services.

Privatized veterinary services, modelled on European or North American systems, have been established in some parts of the world with more or less success (Malabar Regional Cooperative Milk Production Union, personal communication, 1999). They have worked especially well in urban areas (Mpelumbe 1994). They have not worked well in remote arid and semi-arid areas of the world, where livestock herding is very extensive and people do not have money to pay for the services (Odeyemi 1994). Before privatization, the state run service and governments trained a hierarchy of locally recruited veterinary auxiliaries or veterinary scouts, the original community animal health service. These were people who received up to three years training in animal health and disease surveillance, and were responsible for dispensing animal health care and for notifying the veterinary authorities of disease outbreaks. As the funding decreased, many of these veterinary auxiliaries and scouts were made redundant and turned to other employment.

The benefits of these community animal health services have since been recognized. Governmental and nongovernmental organizations, working in collaboration with national government livestock and veterinary departments, have revived the concept of the community animal health worker as deliverer of community animal health services in remote rural areas (Huttner 2000). Typically in these community animal health services, the community animal health worker does not receive a salary from the state but is given money through the programme for a limited time. The aims are for the community animal health worker to make a living by selling his or her livestock services, and the programmes to become self-sustaining. These community animal health workers go by many different names, such as 'community (based) animal health workers', 'paravets', 'barefoot vets', or 'animal health auxiliaries'. Their skills vary according to their training but generally include correct administration of vaccines, antibiotics, anthelmintic drugs, acaricidal drugs, and trypanocidal drugs in addition to husbandry, nutrition, and management knowledge (Hadrill 1982). The community animal health worker is usually provided with a start-up kit of veterinary drugs and

equipment and is supported by the establishment of a rural pharmacy to replenish stocks (Muir 1999).

Community animal health workers have been delivering community animal health services in Africa, Asia, and Latin America since the 1970s. While the provision of community animal health services seems common sense, very little work has evaluated its impact. The organizations that train and support the community animal health workers have been monitoring their work and attempting to evaluate the extent of their impact on the health of livestock and on the welfare of farmers (Matti 2000). Until this Cochrane Review there was no systematic analysis of the evaluation and impact assessment reports of community animal health services. This means we did not know the extent of the impact of the community animal health workers on farmers and their livestock.

Benefits and harms

Community animal health services can help farmers who rely heavily or exclusively on livestock for their income by keeping the animals healthy and productive. For example, community animal health workers can treat livestock for chronic conditions such as worms or tick infestations that decrease the animals' productivity. They can also vaccinate herds against diseases that can kill entire herds, such as rinderpest.

Community animal health services could also be harmful to vulnerable farmers. The community animal health workers must attempt to make a living from selling their services, which include veterinary drugs. They may attempt to sell the farmer drugs that he does not need, increase the cost of the drugs, or dilute the drugs in order to make or save money. The community animal health service may draw farmers away from using traditional medicines (ethnoveterinary medicines) in order to make money from encouraging the use of conventional medicines. The loss of indigenous knowledge is culturally harmful.

This review summarizes the available evidence on the effects of community animal health services from randomized controlled trials and controlled before-and-after studies. We have summarized relevant information from other study designs in a separate article (Martin Curran 2002b).

OBJECTIVES

To summarize reliable research of community animal health services on indicators for household wealth and health.

METHODS

Criteria for considering studies for this review

Types of studies

Individual, cluster, and quasi-randomized controlled trials; controlled before and after studies.

Types of participants

Communities in low-income countries that keep livestock (includes cattle, sheep, goats, camels, llama, pigs, poultry). Low-income countries have a gross national income (GNI) per capita of 755 USD or less (World Bank 2002).

Livestock keepers can include settled farmers, nomadic and semi-nomadic herders, pastoralists, and agro-pastoralists. Livestock keepers include the head of the household, his or her family, and the community or extended family amongst whom they live.

Types of interventions

Intervention

Content: Basic preventive and curative animal health services provided by a community animal health worker. This includes all paravet practices, such as vaccination, castration, and drug administration, with or without extension (health, nutrition, and husbandry messages).

Provider: Community animal health services may be delivered by government or nongovernmental organizations with or without the support of multilateral or bilateral donors.

Other characteristics: These services may be initiated as projects or programmes of finite time. Services may be provided free or for a charge.

We exclude animal health services provided by qualified veterinarians (public or private), traditional animal health services provided by a healer or other person, and extensions where it is provided by an extension worker who is salaried and not expected to recover cost of veterinary drugs.

Control

No community animal health services or alternative animal health services.

Types of outcome measures

Primary

1. Livelihood indicators

- Number of children sent to school.
- Monthly household expenditure.
- Monthly household income.
- Possession of consumer goods such as radio, bicycle, or vehicle.

2. Health indicators

- Nutritional status of children under five years old.
- Infant mortality rate.

Secondary

3. Productivity indicators

- Livestock productivity (products sold, such as animals, milk, eggs).

4. Animal health indicators

- Livestock mortality.
- Livestock fertility (interbirth intervals).
- Livestock illness episodes (morbidity).

5. Implementation indicators

- Number of animals seen.

- Number of visits.
- Workers active two years after programme started.
- Quantity of drugs sold.
- Number of community animal health workers trained.

6. Adverse events

Search methods for identification of studies

We attempted to identify all relevant studies regardless of language or publication status (published, unpublished, in press, and in progress).

Databases

We searched the following databases using the search terms and strategy described in [Appendix 1](#): Cochrane Infectious Diseases Group Specialized Register (January 2011); Cochrane Central Register of Controlled Trials (CENTRAL), published in *The Cochrane Library* (2010, Issue 4); MEDLINE (1966 to January 2011); AGRIS (1975 to January 2011); Science Citation Index (2000 to January 2011); STN SIGLE (1976 to 2011); and AGRICOLA (US National Agricultural Library; accessed January 2011).

Researchers and organizations

We searched the websites listed in [Appendix 2](#) between July and September 2000. For unpublished and ongoing studies, we contacted individual researchers working in the field and organizations including those listed in [Appendix 3](#) during August and September 2000.

Reference lists

We also checked the reference lists of all studies identified by the above methods.

Data collection and analysis

The first author scanned the results of the literature search for potentially relevant studies. Both authors independently assessed eligibility of these studies using the full articles and an eligibility form based on the inclusion criteria. Paul Garner (Co-ordinating Editor of the Cochrane Infectious Diseases Group) assisted us where there were uncertainties.

No studies met the inclusion criteria. Should we identify any eligible studies we will use the methods outlined in our protocol to assess their methodological quality, extract data, and analyse the data.

RESULTS

Description of studies

We identified 19 potentially relevant studies (14 from the search for the original review ([Martin Curran 2002a](#)) and the rest from search updates), but none met the inclusion criteria (see '[Characteristics of excluded studies](#)'). The 14 studies excluded in the original version of the review have been summarized elsewhere ([Martin Curran 2002b](#)).

Risk of bias in included studies

No studies met the inclusion criteria.

Effects of interventions

No studies met the inclusion criteria.

DISCUSSION

Although no studies met the inclusion criteria, we summarized the available evidence from the 14 studies excluded in the original version of this review in [Martin Curran 2002b](#). These studies generally reported that community animal health services can have a positive impact on human health and wealth, and animal health and productivity, but they were generally of low methodological quality and used a range of outcomes and study designs. Given the amount of money and time invested in this area, and the potential benefits for low-income communities, funders and implementing agencies should insist that future studies should be well designed and use common pragmatic outcomes. The studies should also use a framework to determine whether community animal health services are a cost effective way of improving health in low-income communities dependent on livestock.

AUTHORS' CONCLUSIONS

Implications for practice

The use of community animal health services for improving human health and wealth has not been evaluated in a well-designed randomized controlled trial or before-and-after study, and therefore, is not supported by reliable evidence.

Implications for research

Well-designed randomized controlled trials or controlled before-and-after studies that use standard pragmatic outcomes are needed to evaluate the positive results reported by observational studies.

ACKNOWLEDGEMENTS

VETAID, UK for providing the administrative support for this project. Animal Health Programme, UK Department for International Development UK, for providing the financial support for this project. Diane Donaldson of the Moredun Research Institute for helping with the database searches for the original version of the review ([Martin Curran 2002a](#)).

REFERENCES

References to studies excluded from this review

Admassu 2005 {published data only}

Admassu B, Nega S, Haile T, Abera B, Hussein A, Catley A. Impact assessment of a community-based animal health project in Dollo Ado and Dollo Bay districts, southern Ethiopia. *Tropical Animal Health and Production* 2005;**37**(1):33-48.

Allport 2005 {published data only}

Allport R, Mosha R, Bahari M, Swai E, Catley A. The Use of Community-Based Animal Health Workers to Strengthen Disease Surveillance Systems in Tanzania. *Revue Scientifique Et Technique-Office International Des Epizooties* 2005;**24**(3):921-32.

Catley 1996 {published data only}

Catley A. Pastoralists, paravets and privatisation: experiences in the Sanaag region of Somaliland. Pastoral Development Network series. Vol. **39**, London: Overseas Development Institute, 1996.

Dupont 2003 {published data only}

Dupont A. VETAID / CEDES Gaza Post Emergency Livestock Support Project Impact Assessment. Unpublished report for VETAID, UK.

Grandin 1991 {published data only}

Grandin B, Thampy R, Young J. Case study village animal healthcare: A community based approach to livestock development in Kenya. London: Intermediate Technology, 1991.

Hadrill 1982 {published data only}

Hadrill D. Training of community animal health workers: a review. ITDG Agriculture Animal Health Working Group 1982.

Huttner 2000 {unpublished data only}

Huttner K. Impact assessment of a community-based animal health service program in Northern Malawi [MSc thesis]. New Zealand: Massey University, 2000.

Jones 1999 {unpublished data only}

Jones BA, Deemer B, Leyland TJ, Mogga W, Stem E. Community-based animal health services in southern Sudan: the experience so far. www.vetwork.org.uk/baj-sudan.html (accessed 10 June 2000).

Lohr 1986 {unpublished data only}

Lohr KF, Bhannasiri T, Aranyakamanda P, Meemark N, Choochandra T, Leidl K. Farmers' self-help basic animal health service in north-east Thailand. Proceedings of the Fifth International Conference on Livestock Production and Diseases in the Tropics. 1986 Aug 18-22; Kuala Lumpur. 1986:235-9.

Mariner 1994 {published data only}

Mariner JC, Akabwai DMO, Toyang J, Zoyem N, Ngagyou A. Community-based vaccination with thermostable vero cell-adapted rinderpest vaccine (Thermovax). *The Kenya Veterinarian* 1994;**18**(2):507-9.

Moktan 1990 {unpublished data only}

Moktan D, Mitchelhill BK, Joshi YR. Village animal health workers in the Koshi hills: an evaluation report. Pakhribas Agricultural Centre, Kathmandu, Nepal 1990.

Morris 1989 {unpublished data only}

Morris RS, Meemark N. Factors influencing adoption of the basic animal health service. Proceedings of the International Seminar on Animal Health and Production Services for Village Livestock. 1989 Aug 2-9; Khon Kaen, Thailand. 1989:383-98.

Mugunieri 2004 {published data only}

Mugunieri GL, Irungu P, Omiti JM. Performance of community-based animal health workers in the delivery of livestock health services. *Tropical Animal Health and Production* 2004;**36**(6):523-35.

Odhiambo 1998 {unpublished data only}

Odhiambo O, Holden S, Ackello-Ogutu C. Oxfam Wajir Pastoral Development Project: Economic Impact Assessment Report. Oxfam UK/Ireland, Nairobi, Kenya 1998.

Sanaag CBO 1999 {unpublished data only}

Sanaag community based organisation. ActionAid Somaliland Programme Review. London: ActionAid, June 1999.

Schreuder 1996 {published data only}

Schreuder BE, Noorman N, Halimi M, Wassink G. Livestock mortality in Afghanistan in districts with and without a veterinary programme. *Tropical Animal Health and Production* 1996;**28**(2):129-36.

Schreuder 1998 {published data only}

Schreuder BE, Noorman N, Halimi M, Van Dommelen M, Henneken M, Wassink G. Further observations on the impact of a veterinary programme in Afghanistan on seasonal livestock mortality. *Tropical Animal Health and Production* 1998;**30**(2):83-9. [MEDLINE: PMID 9719833]

Tibbo 1998 {unpublished data only}

Tibbo K. Dairy goat and animal healthcare project: Meru and Tharaka-Nithi Districts, Kenya. FARM Africa, UK 1998.

Young 1994 {published data only}

Young J, Stoufer K, Ojha N, Dijkema HP. Case study: animal healthcare training, Nepal's animal health improvement training programme. London: Intermediate Technology, 1994.

Additional references

Leonard 1993

Leonard D K. Structural reform of the veterinary profession in Africa and the new institutional economics. *Development and Change* 1993;**24**(2):227-67.

Matti 2000

Matti J. Final evaluation report of the Participatory Animal Health Project, Tanzania. Vetaid UK 2000.

Mpelumbe 1994

Mpelumbe IS. Perspectives on the privatisation of veterinary practices in the context of livestock production in Africa. *OIE* 1994;73-87.

Muir 1999

Muir A. The Participatory Animal Health Project, Simanjiro District, Tanzania: Review. Vetaid UK 1999.

Odeyemi 1994

Odeyemi IA. A review of the policy to privatise animal health delivery services in Nigeria. University of Edinburgh 1994.

Schillhorn 1995

Schillhorn van Veen T, de Haan C. Trends in the organization and financing of livestock and animal health services. *Preventive Veterinary Medicine* 1995;**25**:225-40.

World Bank 2002

World Bank. Country classification. www.worldbank.org/data/countryclass/countryclass.html (accessed 6 June 2002).

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Martin Curran 2002a

Martin Curran M, MacLehose HG. Community animal health services for improving household wealth and health status of low income farmers. *Cochrane Database of Systematic Reviews* 2002, Issue 4. [DOI: 10.1002/14651858.CD003049.pub2]

Martin Curran 2002b

Martin Curran M, MacLehose HG. Community animal health services for improving household wealth and health status of low-income farmers. *Tropical Animal Health and Production* 2002;**34**(6):449-70.

CHARACTERISTICS OF STUDIES

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Admassu 2005	Study design
Allport 2005	Incorrect outcomes
Catley 1996	Study design ^a
Dupont 2003	Study design
Grandin 1991	Study design ^a
Hadrill 1982	Study design ^a
Huttner 2000	Study design ^a
Jones 1999	Study design ^a
Lohr 1986	Study design ^a
Mariner 1994	Study design ^a
Moktan 1990	Study design ^a
Morris 1989	Study design ^a
Mugunieri 2004	Study design
Odhiambo 1998	Study design ^a
Sanaag CBO 1999	Study design ^a
Schreuder 1996	Study design ^a

Study	Reason for exclusion
Schreuder 1998	Study design ^a
Tibbo 1998	Study design ^a
Young 1994	Study design ^a

*See [Martin Curran 2002b](#) for further information.

APPENDICES

Appendix 1. Search methods: detailed search strategies for databases

Search set	CIDG SR ^a	CENTRAL	MEDLINE	AGRICOLA	Science Citation Index
1	veterinary	veterinary	animal health	animal health	animal health
2	animal*	animal*	animal disease*	animal disease*	animal disease*
3	—	—	animal husbandry	animal husbandry	animal husbandry
4	—	—	livestock	livestock	livestock
5	—	—	draught animal*	draught animal*	draught animal*
6	—	—	working animal*	working animal*	working animal*
7	—	—	cattle	cattle	cattle

(Continued)

8	—	—	poultry	poultry	poultry	poultry
9	—	—	ruminant*	ruminant*	ruminant*	ruminant*
10	—	—	1-9/OR	1-9/OR	1-9/OR	1-9/OR
11	—	—	vet*	vet*	vet*	vet*
12	—	—	paravet*	paravet*	paravet*	paravet*
13	—	—	animal technician*	animal technician*	animal technician*	animal technician*
14	—	—	paraprofessional*	paraprofessional*	paraprofessional*	paraprofessional*
15	—	—	barefoot worker*	barefoot worker*	barefoot worker*	barefoot worker*
16	—	—	11-15/OR	11-15/OR	11-15/OR	11-15/OR
17	—	—	village	village	village	village
18	—	—	community	community	community	community
19	—	—	cooperative extension service	cooperative extension service	cooperative extension service	cooperative extension service
20	—	—	intermediate service	intermediate service	intermediate service	intermediate service

(Continued)

						ate ser- vice
21	—	—	pastoral*	pastoral*	pastoral*	pas- toral*
22	—	—	rural development	rural development	rural development	ru- al de- vel- op- ment
23	—	—	farm*	farm*	farm*	farm*
24	—	—	17-23/OR	17-23/OR	17-23/OR	17-23/ OR
25	—	—	livelihood	livelihood	livelihood	livi- hood
26	—	—	income	income	income	in- come
27	—	—	returns	returns	returns	re- turns
28	—	—	socio-economic*	socio-economic*	socio-economic*	so- cio-eco- nom- ic*
29	—	—	social security	social security	social security	so- cial se- cu- ri- ty
31	—	—	evaluation	evaluation	evaluation	eval- u- a- tion
32	—	—	profitability	profitability	profitability	prof- itabil- i- ty
33	—	—	poverty	poverty	poverty	pover- ty
34	—	—	25-33/OR	25-33/OR	25-33/OR	25-33/ OR
35	—	—	10 AND 16 AND 24 AND 34	10 AND 16 AND 24 AND 34	10 AND 16 AND 24 AND 34	10 AND 16

(Continued)

AND
24
AND
34

^aCochrane Infectious Diseases Group Specialized Register.

Appendix 2. Search methods: websites

Name	Website address
Africa Online	www.africaonline.com
African Development Bank Group	www.afdb.org
Canadian Hunger Foundation - Partners in Rural Development	www.partners.ca
Care	www.care.org
Centre for Information on Low External Input Sustainable Agriculture (ILEIA)	www.ileia.org
Centro de Estudios Uruguayo de Tecnologías Apropriadas (CEUTA)	fp.chasque.apc.org:8081/ceuta
Decentralised Livestock Services in Eastern Indonesia (DELIVERI)	www.deliveri.org
ELDIS (Gateway to Information Sources on Development and the Environment)	www.eldis.org/index.htm
Food and Agriculture Organization of the United Nations	www.fao.org
Ford Foundation	www.fordfound.org
Global Forum on Agricultural Research (GFAR)	www.egfar.org
International Development Research Centre (IDRC)	www.idrc.ca
International Fund for Agricultural Development (IFAD)	www.ifad.org
International Livestock Research Institute	www.cgiar.org/ilri
Kenyaweb Agriculture	www.kenyaweb.com/agriculture
New Agriculturalist	www.new-agri.co.uk
One World.net	www.oneworld.net
Overseas Development Institute (ODI)	www.odi.org.uk
Pan Asia Networking (The Asian E-Development Community)	www.panasia.org.sg
Sustainable Rural Development Information System (SRDIS)	srdis.ciesin.columbia.edu
Technical Centre for Agricultural and Rural Co-operation	www.agricta.org

(Continued)

US Department of Agriculture

www.usda.gov

World Bank

www.worldbank.org

Appendix 3. Search methods: organizations

Organization

Action Against Hunger

ActionAid

Adventist Development and Relief Agency

African Muslim Agency

Africare

Agency for Development Cooperation and Research

Care International

Catholic Relief Services

Development Aid from People to People;

German Agro Action

Institut d'Elevage et de Médecine Vétérinaire des Pays Tropicaux (IEMVT)

Lutheran World Federation

Norwegian Peoples Aid

Oxfam

Società Italiana di Veterinaria e Zootecnica Tropicale per la Cooperazione Internazionale - VSF Italia (SivTro)

Vetaid

Vétérinaires Sans Frontières, Belgium

Vétérinaires Sans Frontières, France

Vétérinaires Sans Frontières, Switzerland

Vetermon

Vetwork, UK

War on Want

(Continued)

World Vision International

WHAT'S NEW

Date	Event	Description
13 April 2011	New search has been performed	New search conducted; one study found and excluded

HISTORY

Protocol first published: Issue 4, 2001

Review first published: Issue 4, 2002

Date	Event	Description
5 August 2008	Amended	Converted to new review format with minor editing.
6 February 2006	New citation required but conclusions have not changed	2006, Issue 2: update following a comprehensive search for new studies.

CONTRIBUTIONS OF AUTHORS

Marina Martin Curran searched the internet and contacted relevant persons in the field to try and elicit new studies. Harriet G MacLehose helped assess the studies and prepared the update of the review.

DECLARATIONS OF INTEREST

Between 1997 and 2001, Marina Martin Curran was employed by VETAID, an organization that trains and supports community animal health workers in low income countries.

Harriet G MacLehose: none known.

SOURCES OF SUPPORT

Internal sources

- Liverpool School of Tropical Medicine, UK.

External sources

- Department for International Development, UK.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

2002, Issue 4 (original review): HG MacLehose joined the review team; rephrased the objectives; cohort studies no longer included; slight revision of the wording of the 'Types of participants'; extended and updated the search dates; modified methods to take into account new Cochrane Infectious Diseases Group guidelines.

INDEX TERMS

Medical Subject Headings (MeSH)

*Animals, Domestic; *Developing Countries; Animal Husbandry [*organization & administration]; Community Health Services [*organization & administration]

MeSH check words

Animals; Humans