

## **Materials Design Analysis Reporting (MDAR) Checklist for Authors**

The MDAR framework establishes a minimum set of requirements in transparent reporting applicable to studies in the life sciences (see Statement of Task: [doi:10.31222/osf.io/9sm4x](https://doi.org/10.31222/osf.io/9sm4x)). The MDAR checklist is a tool for authors, editors and others seeking to adopt the MDAR framework for transparent reporting in manuscripts and other outputs. Please refer to the MDAR Elaboration Document for additional context for the MDAR framework.

## Materials

<b>Antibodies</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
For commercial reagents, provide supplier name, catalogue number and RRID, if available.		n/a
<b>Cell materials</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
<b>Cell lines:</b> Provide species information, strain. Provide accession number in repository <b>OR</b> supplier name, catalog number, clone number, <b>OR</b> RRID		n/a
<b>Primary cultures:</b> Provide species, strain, sex of origin, genetic modification status.		n/a
<b>Experimental animals</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
<b>Laboratory animals:</b> Provide species, strain, sex, age, genetic modification status. Provide accession number in repository <b>OR</b> supplier name, catalog number, clone number, <b>OR</b> RRID		n/a
<b>Animal observed in or captured from the field:</b> Provide species, sex and age where possible	African buffalo ( <i>Syncerus caffer</i> ) Experimental study: 24 1-2 year olds, mixed sexes Cohort study: 108 individuals, mixed age and sex. Information provided in Materials & Methods, sections "Experimental Study" and "Cohort Study".	
<b>Model organisms:</b> Provide Accession number in repository (where relevant) <b>OR</b> RRID		n/a
<b>Plants and microbes</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
<b>Plants:</b> provide species and strain, unique accession number if available, and source (including location		n/a
<b>Microbes:</b> provide species and strain, unique accession number if available, and source	FMDV viral lines KNP/196/91/1 PK1 RS5, KNP/19/89/2 PK1 RS4, and KNP/1/08/3 PK1 RS4 (Genbank accession numbers KR108948, KR108949 and KR108950) provided in Materials & Methods, section "Experimental Study".	
<b>Human research participants</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
Identify authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval.		n/a
Provide statement confirming informed consent obtained from study participants.		n/a
Report on age and sex for all study participants.		n/a

## Design

<b>Study protocol</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
For clinical trials, provide the trial registration number <b>OR</b> cite DOI in manuscript.		n/a
<b>Laboratory protocol</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
Provide DOI or other citation details if detailed step-by-step protocols are available.		n/a
<b>Experimental study design (statistics details)</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
State whether and how the following have been done, <b>or</b> if they were not carried out.		
Sample size determination	Sample size per treatment was four animals, based on feasibility and previous FMD challenge studies <sup>16</sup> .	
Randomisation	Buffalo were randomly assigned to experimental treatments, stratified by sex (ages were all similar), provided in Materials & Methods, section "Experimental Study".	
Blinding		n/a
Inclusion/exclusion criteria		n/a
<b>Sample definition and in-laboratory replication</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
State number of times the experiment was replicated in laboratory		n/a
Define whether data describe technical or biological replicates		n/a
<b>Ethics</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
Studies involving human participants: State details of authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval.		n/a
Studies involving experimental animals: State details of authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval.	Ethical clearance was obtained from Oregon State University (ACUP 4478), South African National Parks (project #JOLAE 1157), the South African Department of Agriculture, Forestry and Fisheries: Directorate of Animal Health (Section 20 permit #12/11/1/8/3), Onderstepoort Veterinary Research Animal Ethics Committee (#100261Y5). This information is provided in Materials & Methods, section "Experimental Study".	
Studies involving specimen and field samples: State if relevant permits obtained, provide details of authority approving study; if none were required, explain why.	Sampling of African buffalo was covered under the South African National Parks permit for the project, permit #JOLAE 1157. This information is provided in Materials & Methods, section "Experimental Study".	
<b>Dual Use Research of Concern (DURC)</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
If study is subject to dual use research of concern, state the authority granting approval and reference number for the regulatory approval		n/a

## Analysis

<b>Attrition</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
State if sample or data point from the analysis is excluded, and whether the criteria for exclusion were determined and specified in advance.		n/a
<b>Statistics</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
Describe statistical tests used and justify choice of tests.	Details of statistical analyses are given in Supplementary Materials sections S1-S5.	
<b>Data Availability</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
State whether newly created datasets are available, including protocols for access or restriction on access.	Yes – see below. We have not restricted access to these data. We expect (as per custom in our areas of study) that researchers interested in using our data for new analyses contact us for consent.	
If data are publicly available, provide accession number in repository or DOI or URL.	Our experimental data are presented in Fig. S5 and Tables S4 and S5. Our data on birth timing and waning of maternally derived antibodies to FMD are presented in Figs 1 and 2.	
If publicly available data are reused, provide accession number in repository or DOI or URL, where possible.	We used published data from FMD challenge studies to estimate (i) priors for FMD transmission rates, and (ii) the duration of the carrier state in African buffalo. These data are summarized in Tables S3 and S6, respectively. We used published data (refs S81, S82) to estimate mortality rates in African buffalo in Kruger National Park, and (ref 19) to construct a prior for the waning parameter for maternally derived antibodies to FMDVs .	
<b>Code Availability</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
For all newly generated code and software essential for replicating the main findings of the study:		
State whether the code or software is available.	Yes.	
If code is publicly available, provide accession number in repository, or DOI or URL.	Our code for statistical analyses and modeling is available in GitHub (refs 53. <a href="#">FMDVInBuffalo. (Github)</a> and 54. <a href="#">Medlock, J. FMDV. (Github)</a> ).	

## Reporting

<b>Adherence to community standards</b>	<b>Yes (indicate where provided: page no/section/legend)</b>	<b>n/a</b>
MDAR framework recommends adoption of discipline-specific guidelines, established and endorsed through community initiatives. Journals have their own policy about requiring specific guidelines and recommendations to complement MDAR.		
State if relevant guidelines (eg., ICMJE, MIBBI, ARRIVE) have been followed, and whether a checklist (eg., CONSORT, PRISMA, ARRIVE) is provided with the manuscript.		n/a