Supplementary Table S1.
Meta-analysis of Observational Studies in Epidemiology Checklist[1]

Item No	Criteria	Brief description of how the criteria were handled in the meta-analysis
Reporting of background should include		
1	Problem definition	What is the impact of topographic locations on the progression rates of geographic atrophy (GA) lesions in untreated eyes with GA secondary to nonexudative age-related macular degeneration (AMD)?
2	Hypothesis statement	The topographic location is a significant prognostic factor for the GA growth rate and the GA growth rate varies across different topographic zones of the retina.
3	Description of study outcome(s)	The effective radius growth rate (in mm/year) of GA lesion.
4	Type of exposure or intervention used	Untreated eyes with GA secondary to nonexudative AMD.
5	Type of study designs used	Not limited to any study type.
6	Study population	Patients diagnosed of GA secondary to nonexudative AMD in at least one eye without any treatment intended to slow or halt the atrophy progression.
Reporting of search strategy should include		
7	Qualifications of searchers (e.g., librarians and investigators)	The librarian (Grossetta Nardini, Holly) who created the searches has a master's degree and 20 years of experience as a medical librarian and expert literature database searcher.
8	Search strategy, including time period included in the synthesis and key words	Reported in Supplementary Method. No limitation by time period/date(s).
9	Effort to include all available studies, including contact with authors	Multiple databases were searched for thoroughness. References of all articles meeting the inclusion criteria were screened. Senior author knows the field and has been in contact with authors.
10	Databases and registries searched	MEDLINE, EMBASE, Cochrane Library (Wiley), clinicaltrials.gov, and NLM PubMed
11	Search software used, name and version, including special features used (e.g., explosion)	Ovid interface for MEDLINE and Embase. MeSH terms (controlled vocabulary), adjacency, explosion, and textwords were all used.
12	Use of hand searching (e.g., reference lists of obtained articles)	The reference list of all included articles were further confirmed through hand search.
13	List of citations located and those excluded, including justification	The list is included in Table 1, Table 2, and Supplementary Table S2.

14	Method of addressing articles published in languages other than English	English abstracts were located for all foreign language articles. After screening, no pertinent articles not in English remained.
Item No	**Criteria**	**Brief description of how the criteria were handled in the meta-analysis**
15	Method of handling abstracts and unpublished studies	Unpublished studies and/or conference abstracts without full text were not included.
16	Description of any contact with authors	We contacted the first author of studies that did not report necessary data for our meta-analysis.
Reporting of methods should include		
17	Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	Detailed inclusion criteria were described in the methods section
18	Rationale for the selection and coding of data (e.g., sound clinical principles or convenience)	Studies were included as per inclusion criteria. Study selection was independently performed by at least two reviewers (L.L.S., M.S., F.L., and S.K.). Two reviewers (L.L.S., M.S.) independently extracted the data from each study and the data were relevant to the population characteristics, study design, exposure, and outcome.
19	Documentation of how data were classified and coded (e.g., multiple raters, blinding and interrater reliability)	After data extraction of individual study by M.S. and L.L.S., the two reviewers reviewed the data together. Disparities were resolved through discussion.
20	Assessment of confounding (e.g., comparability of cases and controls in studies where appropriate)	2 investigators assessed confounding factors in each study with Newcastle-Ottawa Scale.
21	Assessment of study quality, including blinding of quality assessors, stratification or regression on possible predictors of study results	Two investigators (L.L.S. and M.S.) evaluated the quality of each study using the Newcastle-Ottawa Scale. This tool has been adopted widely in previous meta-analyses for the evaluation of non-randomized studies.
22	Assessment of heterogeneity	Heterogeneity was assessed with the I^2 index.
Item No	**Criteria**	**Brief description of how the criteria were handled in the meta-analysis**

23	Description of statistical methods (e.g., complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated	Described in the methods section.
24	Provision of appropriate tables and graphics	We included the PRISMA flow-chart and several tables to describe the literature search and its results. Several figures were used to describe the main findings of the analyses and findings.
Reporting of results should include		
25	Graphic summarizing individual study estimates and overall estimate	Supplementary Figure S1-4. Figure 2-4.
26	Table giving descriptive information for each study included	Table 1 and 2.
27	Results of sensitivity testing (e.g., subgroup analysis)	Sensitivity analysis was undertaken by removing one study each time to repeat the random-effects meta-analyses in Figure 2 and Supplementary Figure S2. No single study affected the statistical significance.
28	Indication of statistical uncertainty of findings	The mean estimates and errors for the outcome have been reported in the text, figures, and tables.
Reporting of discussion should include		
29	Quantitative assessment of bias (e.g., publication bias)	Two investigators (L.L.S. and M.S.) evaluated the quality of each study using the Newcastle-Ottawa Scale. Due to the relatively small number of included studies for each random-effects meta-analysis (fewer than 10), we did not perform tests for funnel plot asymmetry to assess publication bias.
30	Justification for exclusion (e.g., exclusion of non-English language citations)	The list is included in Supplementary Table S2.
31	Assessment of quality of included studies	At least 2 investigators (L.L.S. and M.S.) evaluated the quality of each study using the Newcastle-Ottawa Scale. The score for each study is in Supplementary Table S3.
Item No	**Criteria**	**Brief description of how the criteria were handled in the meta-analysis**
Reporting of conclusions should include		

32	Consideration of alternative explanations for observed results	We were only able to identify 4 studies in the literature that allowed us to estimate the effective radius growth rate of GA in each specific retina zone. Although the included studies have relatively high qualities, our results may still be affected by the differences in patient populations, imaging methods, and measurement methods among the studies.
33	Generalization of the conclusions (ie, appropriate for the data presented and within the domain of the literature review)	This meta-analysis demonstrates that the topographic location is a significant prognostic factor for the GA growth rate. The classification of GA lesions into foveal zone involved and spared groups can result in a more significant difference in the GA growth rates between the two groups. The study also suggests that the GA progression speed varies continuously as a function of the retinal eccentricity, and there is a 3.2-fold difference between the maximum and minimum GA effective radius growth rate within the macula. This finding, combined with our modeling of GA expansion, may explain the various shapes of GA lesions and the foveal sparing phenomenon. These results may improve our understanding of the natural GA progression, especially across different retinal locations and assist in the design of future clinical trials.
34	Guidelines for future research	Future clinical and histological studies are required to generate a more refined topographic profile of the GA growth rate and determine the underlying biological mechanisms for the differential GA growth rate across the retina.
35	Disclosure of funding source	The research is not supported by any funding.
PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.		

References:

1. Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting. *JAMA* 2000;283:2008-2012.