

An Analysis of the Medical Decision Support, Expert System, and Artificial Intelligence Literature



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Our research goals

- Profile the past five years of published research on medical decision support literature, including AI, ES, and DSS
 - Looking for trends, clusters of researchers, centers of excellence, and related information from the body of citations
 - Intending to write current literature reviews for the DSS and medical fields



National Library of Medicine

- www.nlm.nih.gov
 - > 4200 worldwide journals in topics medicine.
 - Regardless of source language, English abstracts and keyword indexing is provided for each article
 - Over 11 million articles in the database
 - FREE, unlimited access to public, researchers granted several years ago



Search strategies

- Iterative refinement of searches, isolating Human (vs. veterinary), DSS, ES, and AI articles, by year, by role (diagnostic vs. therapeutic vs. management topics), and by major disease groupings
- Note: Early disappointment at small size of the literature, until we added practice guidelines!



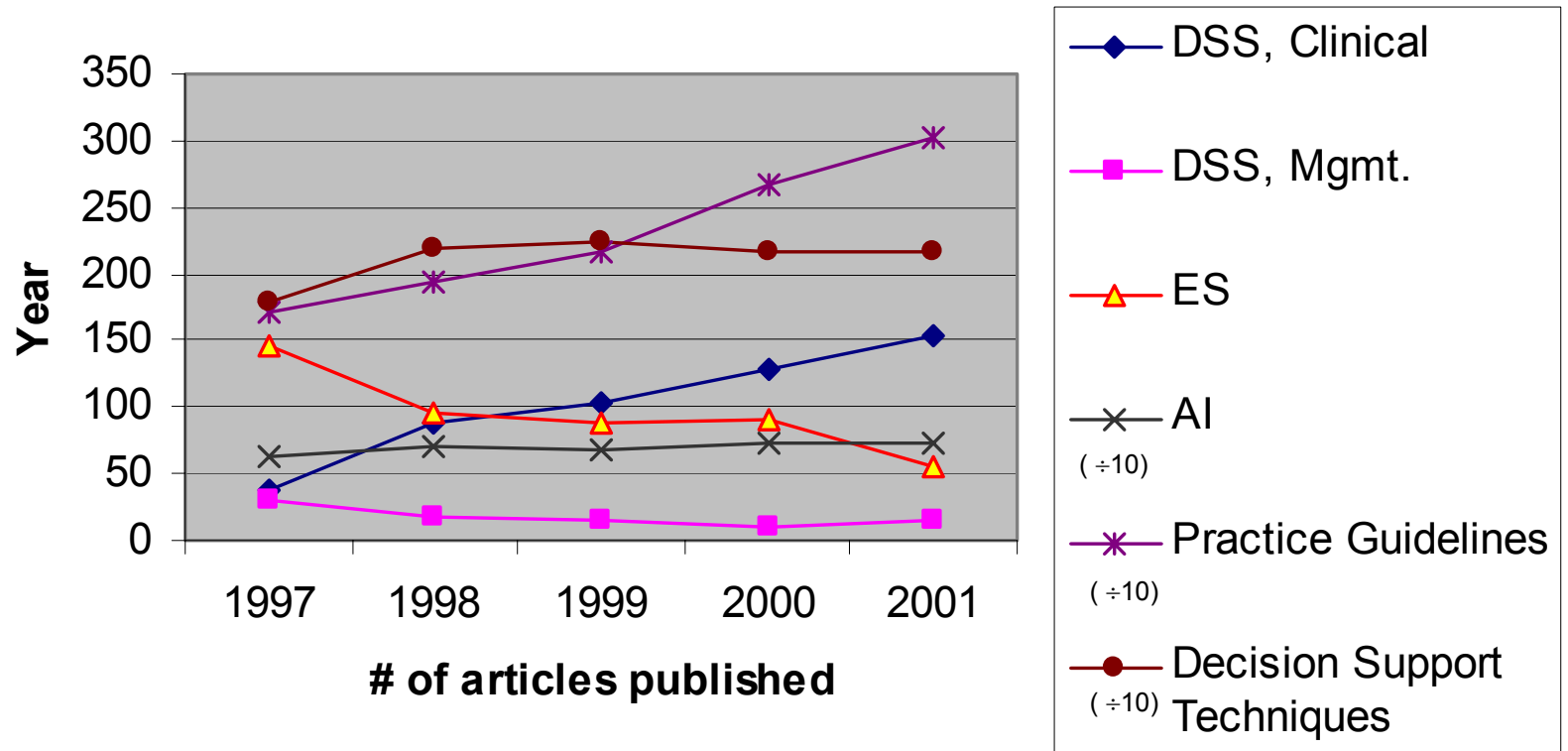
Summary of Overall Findings

**TOTAL year-by-year comparison
of Decision Support Articles from
NLM, as of June, 2002**

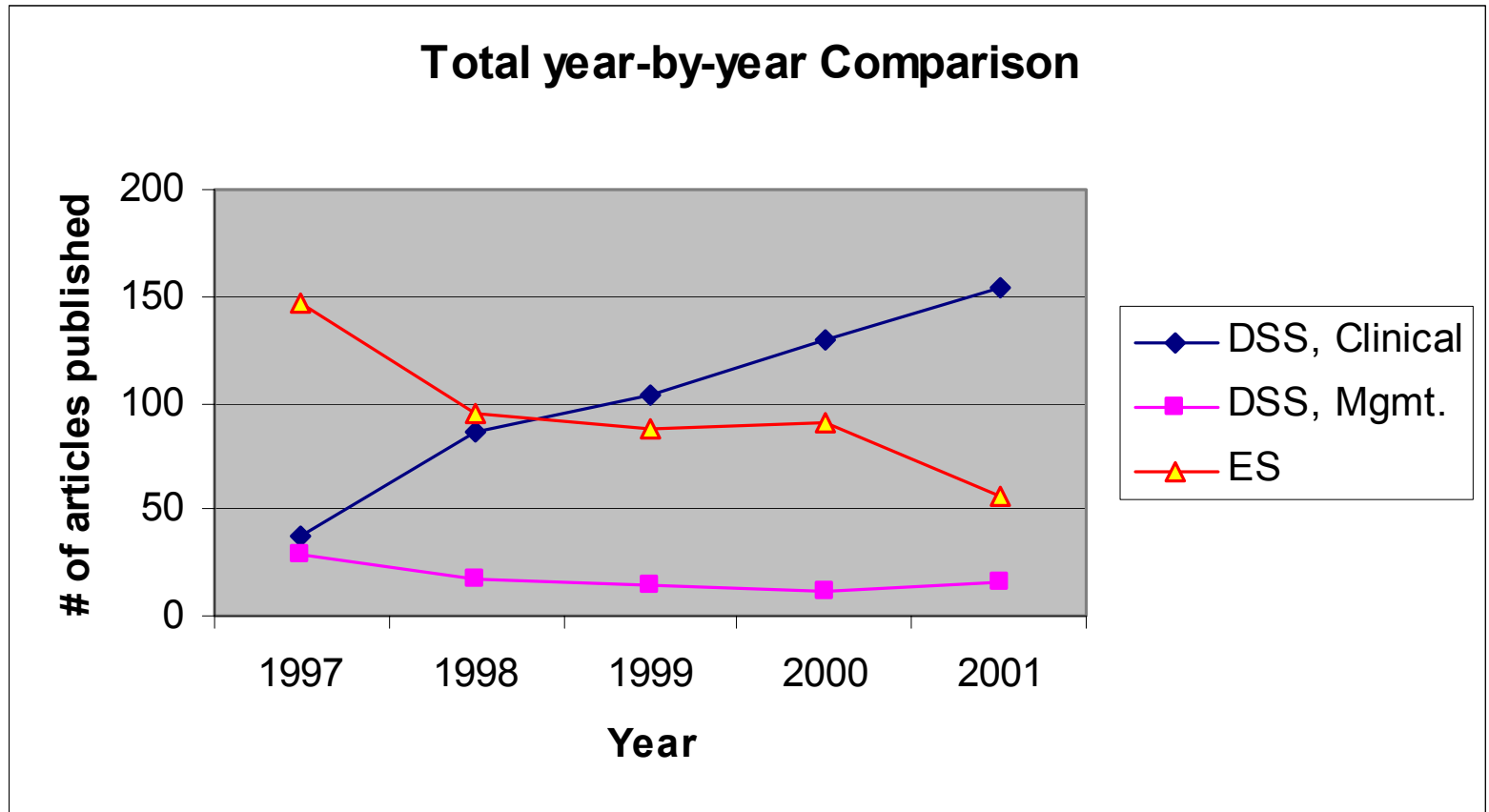
	DSS, Clinical	DSS, Mgmt.	ES	AI	Practice Guidelines	<i>Note: Some Articles Overlap</i> Total of all Decision Support Techniques
1997	37	29	147	635	1722	1780
1998	87	17	95	717	1935	2195
1999	103	14	88	679	2177	2234
2000	129	11	90	729	2677	2159
2001	154	16	56	727	3016	2154
						(overlap) Total: 10522

Overall trends

Total year-by-year comparison

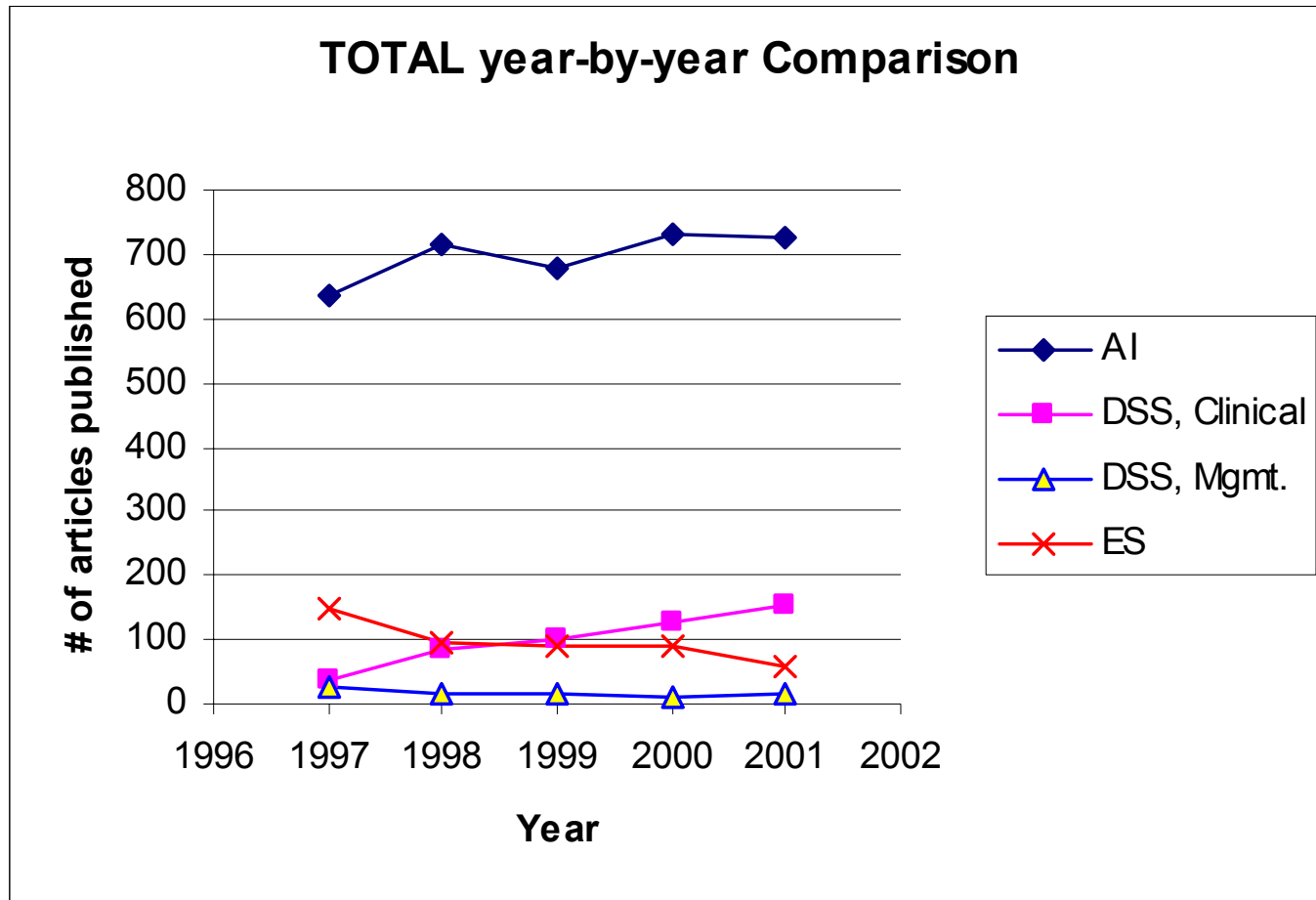


Expert systems articles are waning,
management DSS is flat and minimal, but
clinical DSS is increasing strongly

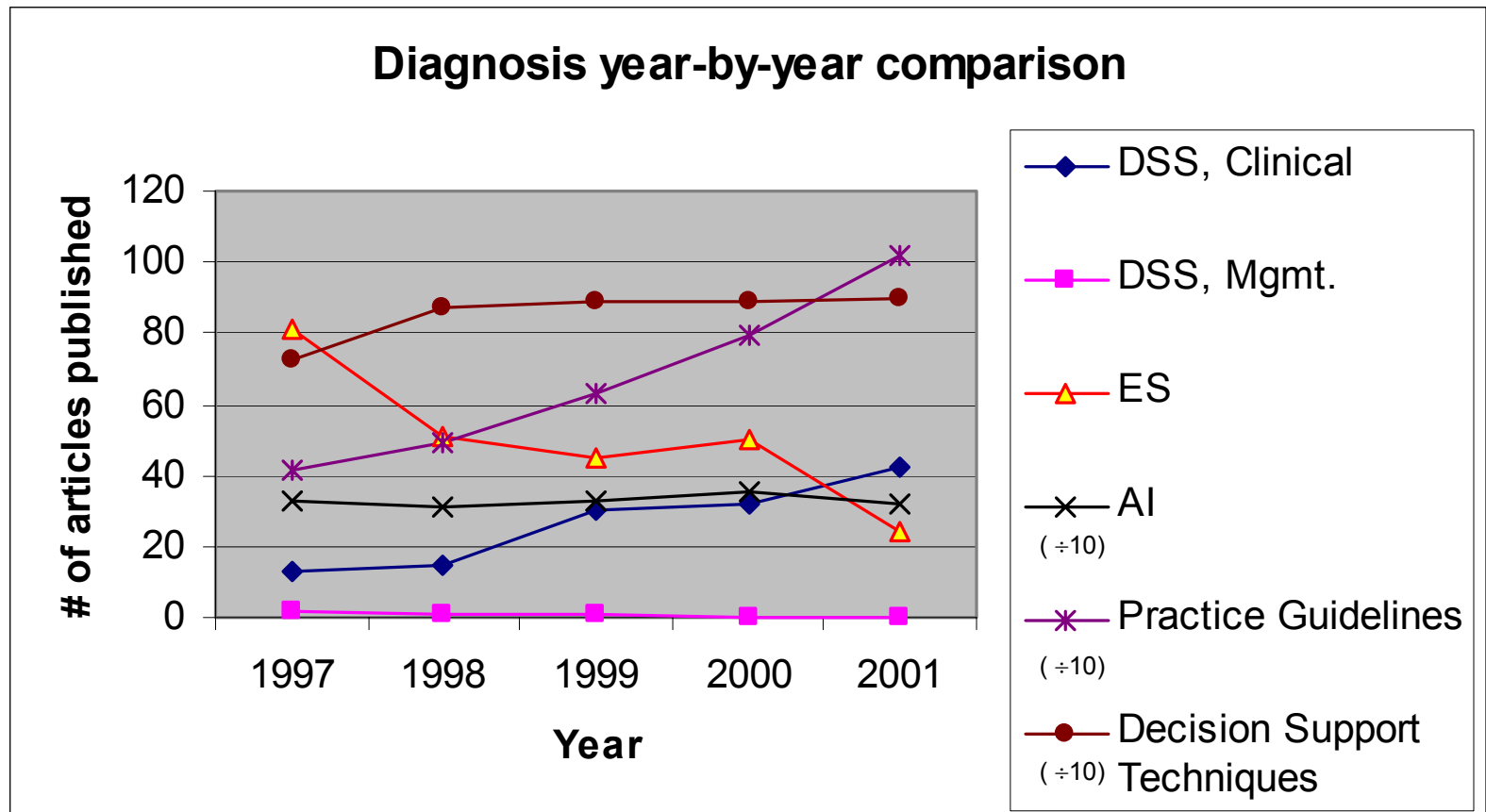


By comparison, AI is robust

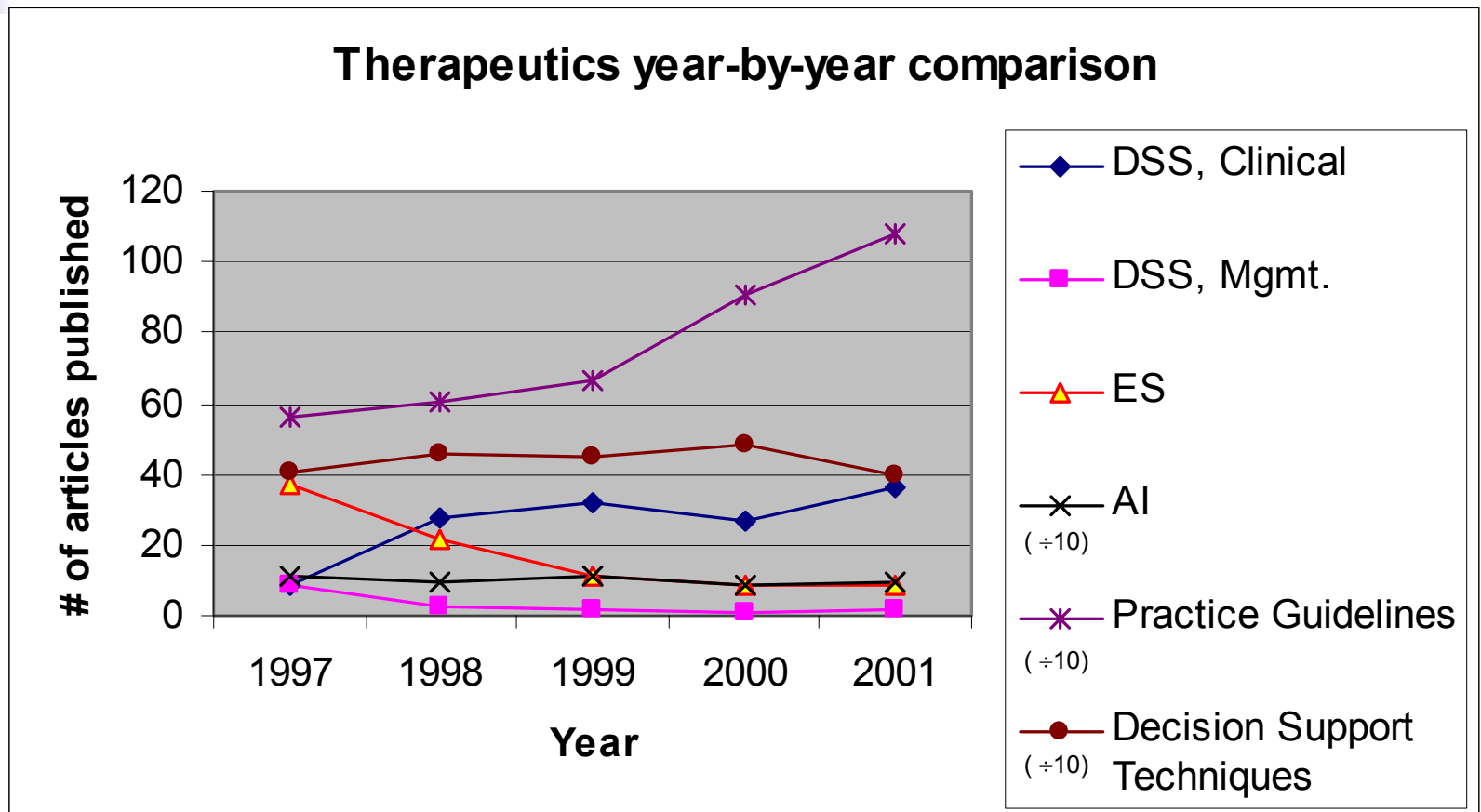
(VERY broad category, including pure AI research, drug discovery, and cancer tumor imaging tools)



Medical diagnostic applications are smaller subset (~30%)...

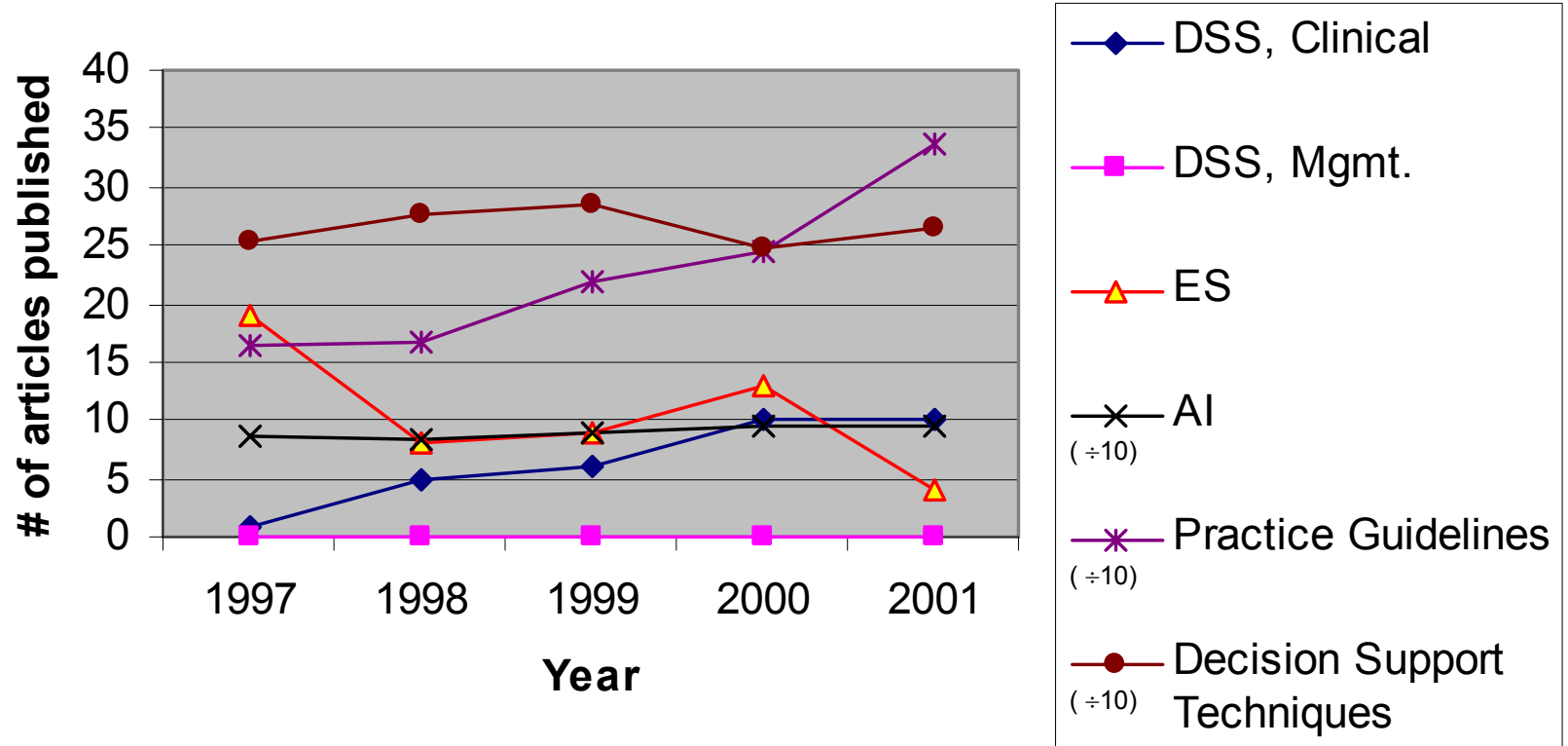


Medical therapeutics applications are even smaller (~20%)...



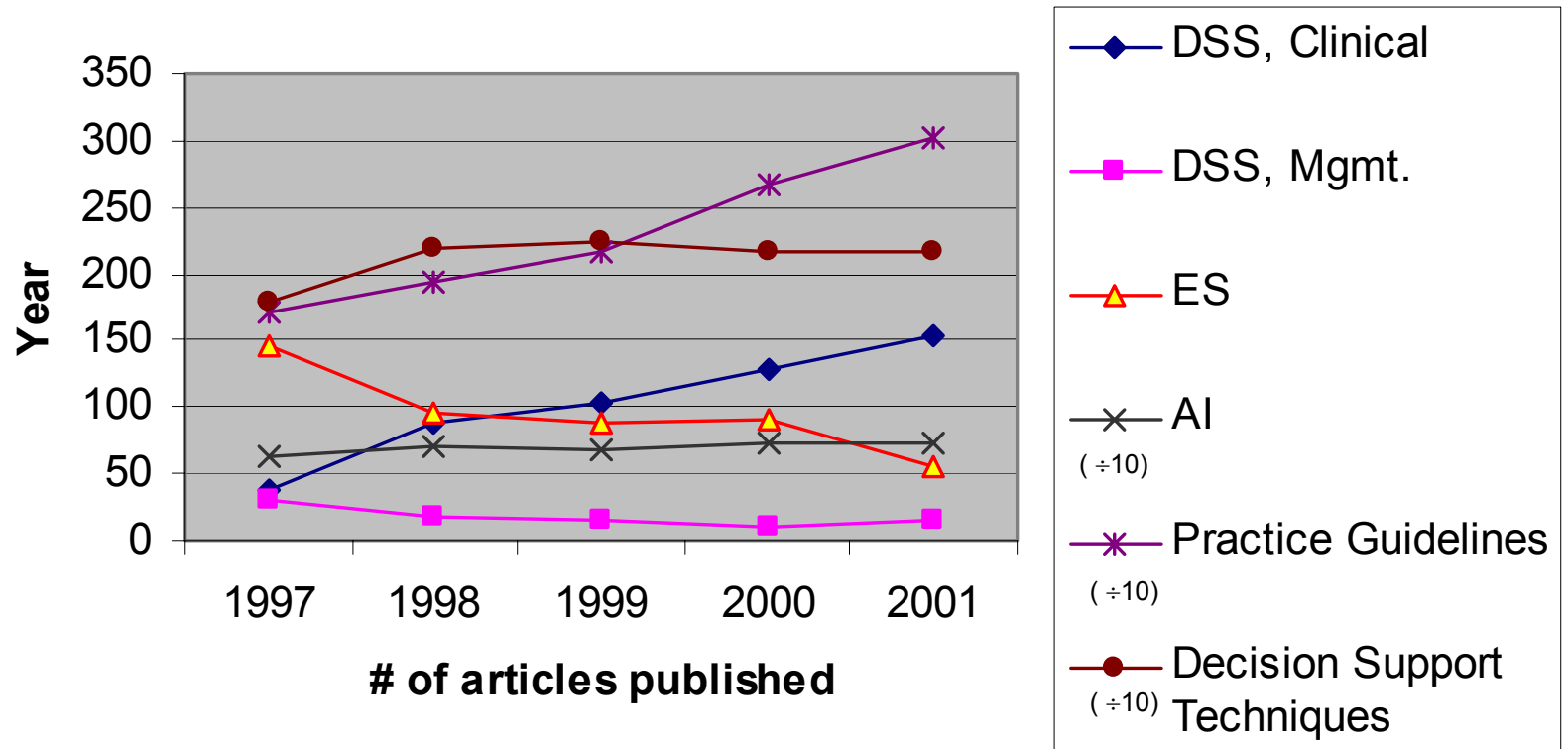
Cancer detection is a significant research area (~30%)

Neoplasms year-by-year



Overall trends

Total year-by-year comparison





Preliminary conclusions

- AI is a large component of published research, but not APPLIED to patient care (diagnosis or therapeutics) yet
 - Ditto for neoplasm topics
- DSS for diagnosis and therapeutics continues at a steady 10% of total articles, but it has grown 400% in the past 5 years!
- DSS for management needs is moribund
- Expert systems literature is vanishing



Food for thought

- Practice guidelines, 10 times bigger than other areas, and growing at 200% in the past 5 years may be a surrogate for ES and DSS at this time
 - Most are paper-based, often driven by managed care (www.ahrq.gov)
- Will improved DSS tools that are more patient-tailored be more successful in the future?



A few final observations

- National Library of Medicine is a valuable resource
 - Using it for detailed research is not as easy as it seems, as the PubMed search optimizer CHANGES many requests to “improve” them!
 - Not “pure,” since abstracts and indexing are provided by PUBLISHERS, not independent librarians or domain experts



Thank you!

Special thanks for the excellent research efforts and data analyses by Deirdre Newbold!

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