Garbage in - garbage out ? Impact of poor reporting on the development of systematic reviews

ACT now: EQUATOR Scientific Symposium

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Rationale (1)

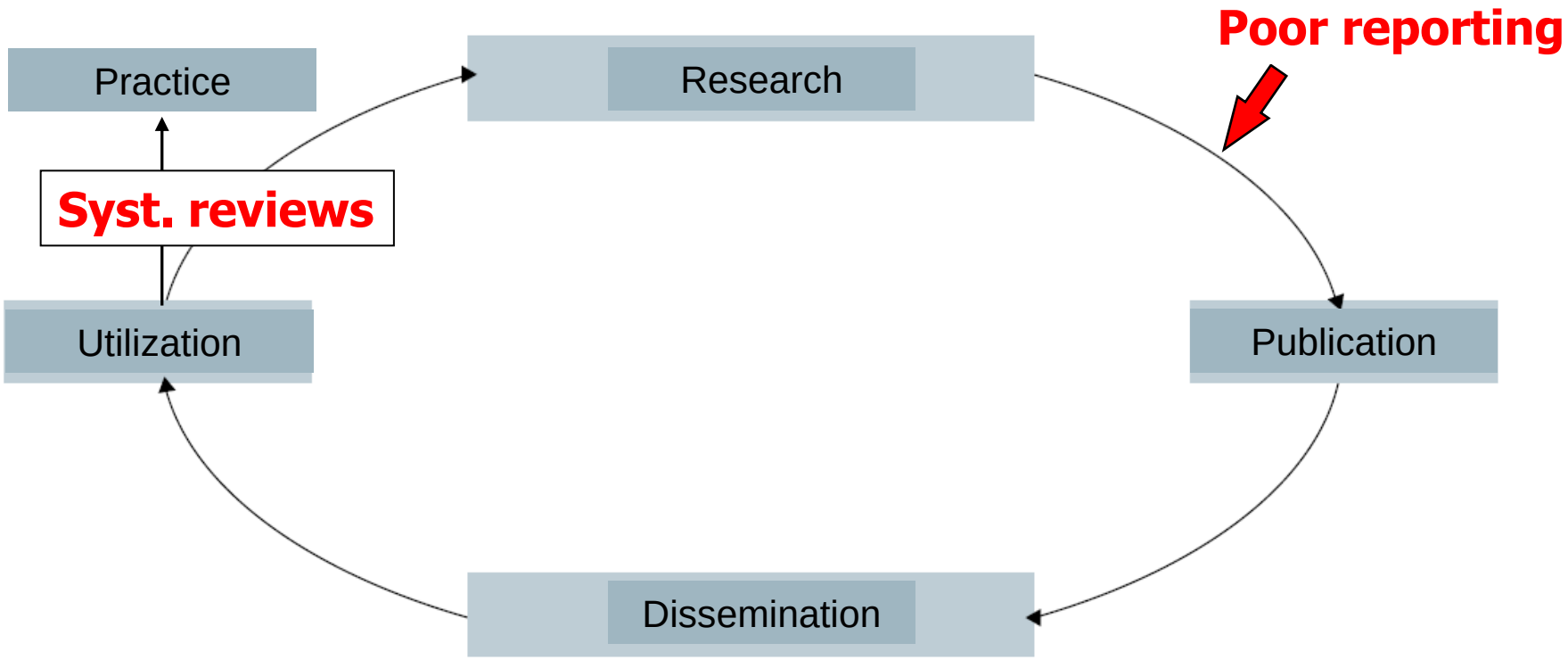
- Systematic reviews play pivotal role in knowledge transfer from clinical research to health care practice

- Value of clinical studies for systematic reviews (and meta-analyses) depends on accuracy and completeness of their publications

Rationale (2)

- Methodological quality needs to be distinguished from reporting quality:
  - Good studies may be reported badly
  - Bad studies may be reported well

Knowledge generation cycle



What do we know about poor reporting ?

Two types of empirical studies:

- Studies analysing reporting quality of trials
  - Use of predefined (CONSORT) items as assessment criteria
  - Also on other types of studies:
    - diagnostic studies using STARD
    - observational studies using STROBE

- Studies comparing additional sources (e.g. study protocols) to subsequent publications

Reporting of trial methodology (1)

- **Chan & Altman Lancet 2005**

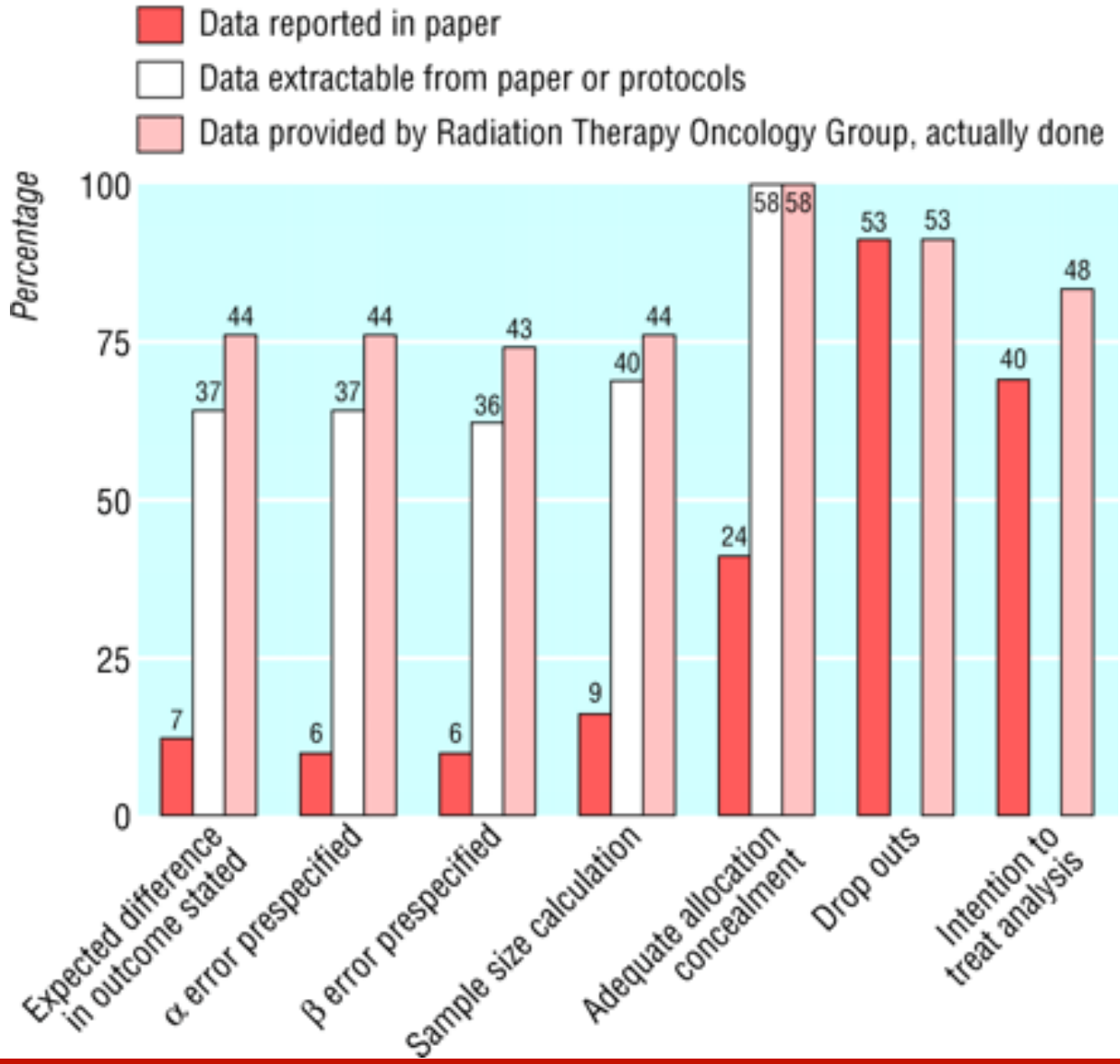
- 519 randomised trials published in Dec 2000 & indexed in PubMed

- **Failure** to report key aspects of trial conduct:
  - 73% Sample size calculation
  - 55% Defined primary outcome(s)
  - 60% Whether blinded or not
  - 79% Method of random sequence generation
  - 82% Method of allocation concealment

Reporting of trial methodology (2)

- **Soares BMJ 2004**
- 56 phase III trials done by Radiation Therapy Oncology Group (US + Can) since 1968
- 58 corresponding publications

- Much information is missing in papers
- Poor reporting ≠ poor study methods



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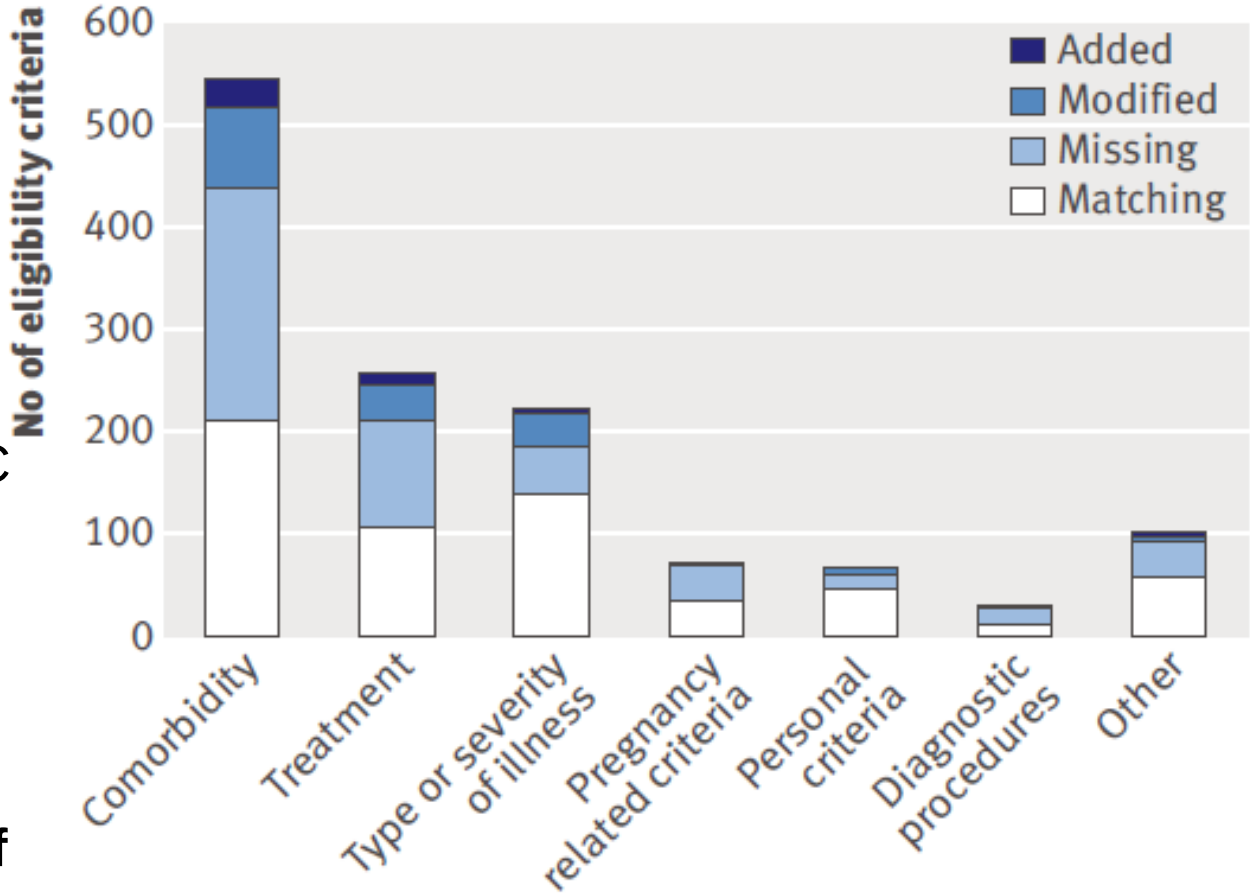
Reporting of trial methodology (3)

- **Chan BMJ 2008**
- 62 trials approved by REC in Copenhagen/DK in 1994/95
- Unacknowledged discrepancies between protocols & publications:
  - sample size calculations (18 / 34 trials),
  - methods of handling protocol deviations (19 / 43)
  - missing data (39 / 49),
  - primary outcome analyses (25 / 42)
  - subgroup analyses (25 / 25)
  - adjusted analyses (23 / 28)

- Interim analyses were described in 13 protocols but mentioned in only 5 corresponding publications

Reporting of eligibility criteria (EC)

- **Blümle BMJ 2011**
- 52 trial protocols submitted to REC in Freiburg in 2000
- 78 corresponding publications
- 1248 prespecified EC
  - 49% matching
  - 38% missing
  - 13% modified
- 51 new EC in papers
- **Differences in EC of all 52 trials**



Number of matching, missing, modified, and added eligibility criteria (n=1299) for each content category

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Consequences of poor reporting

- For review process
  - Critical appraisal (e.g. Risk of Bias tool) hampered
  - Misclassification of study quality
  - Exclusion of studies (e.g. from meta-analysis) if important methodological aspects cannot be elucidated
- For evidence base
  - Existing body of data may be underused / not used at all because it cannot be assessed properly
  - Adds to prevalent underreporting of trials
- For decision making
  - Decisions of HC professionals and patients are potentially based on a weaker evidence base

Quotes from Cochrane reviews:

- "The quality of reporting in general was not very high. Unfortunately every study failed to describe adequate sequence generation and allocation concealment. Though each study claims to be randomised, none reported explicit details."

  Liu X, De Haan S. Chlorpromazine dose for people with schizophrenia. CDSR 2009, Issue 2. Art. No.: CD007778.

- "The eligible trials for this review varied in their design and quality and it was unfortunate that many studies reported data in an intransparent form. The use of structured abstracts and application of the CONSORT guidelines, to which only one [of 21] study adhered, would have improved the reporting quality considerably."

  Horneber et al. Mistletoe therapy in oncology. CDSR 2008, Issue 2. Art. No.: CD003297.

Poor reporting = bias in syst. reviews ?

- Poorly conducted studies tend to overestimate treatment effects
- How about poorly reported studies ?
- Questions:
  - Does poor reporting itself cause bias ?
  - In what direction ?
- Evidence from empirical studies ?

Impact of selective outcome reporting in cohort of Cochrane reviews

- **ORBIT study: Kirkham et al. BMJ 2010**
- 283 Cochrane reviews newly published 2006/07
- 2486 included trials
- 1/3 of reviews with >1 trial suspicious of outcome reporting bias
- 6% trials with evidence that review primary outcome was measured but not (fully) reported.
- Sensitivity analysis of 81 reviews with single MA:
  - 19 with reduction of treatment by >20% when adjusted
- Evidence of outcome reporting bias

Future strategies

- Further improve reporting quality of primary publications
- Complement by information not included in publication (e.g. through author contact)
- Make study protocols accessible
- Make clinical study reports accessible
  - usually confidential, submitted to regulators
  - may replace publications as primary data source in reviews: Cochrane review on Tamiflu (Jefferson et al.)

Poor reporting of systematic reviews

Sacks NEJM 1987

- 83 meta-analyses examined for 23 characteristics
- Only 1 to 14 were adequately reported (mean 7.7, SD 2.7)
- Little improvement 9 years later

Mulrow Ann Int Med 1987

- 50 review articles in 4 journals
- None reported on all 8 pre-specified criteria

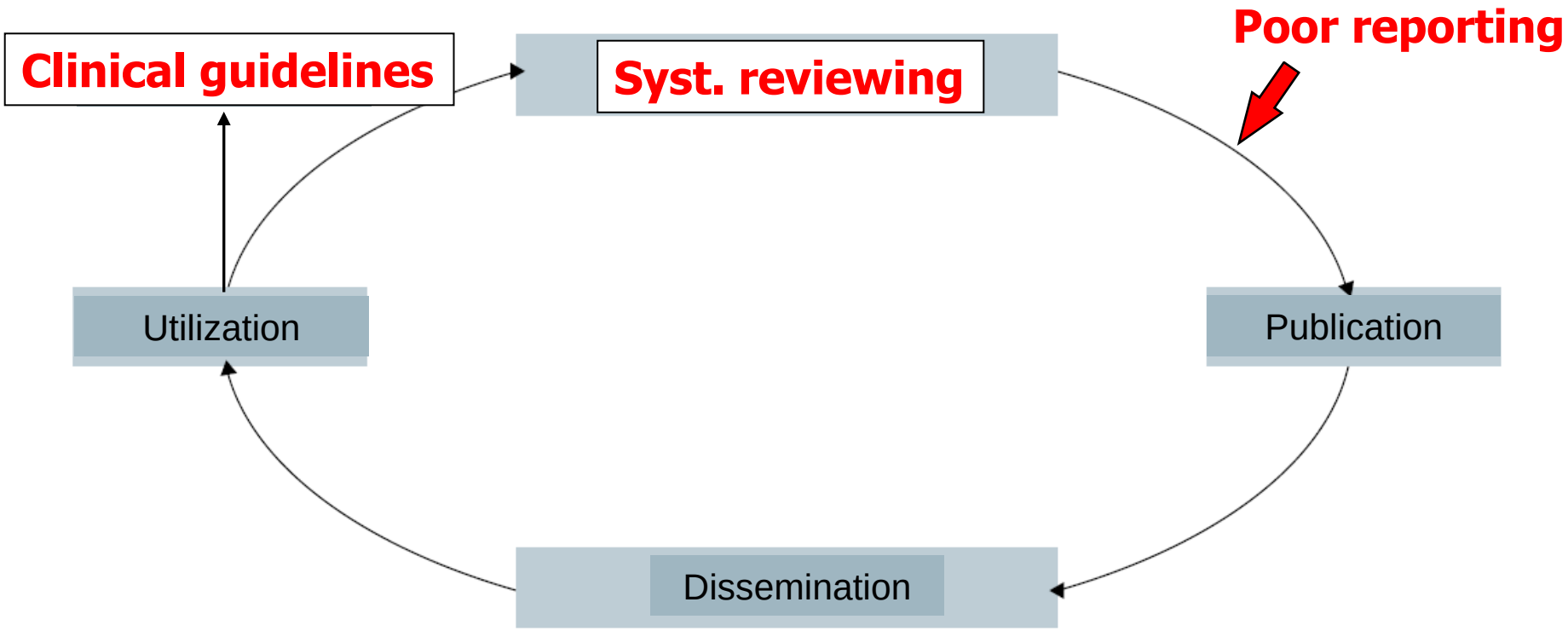
Moher PLoS Med 2007

- 300 systematic reviews indexed in Nov 2004
- Only 23% reported on assessment for publication bias

Reporting quality of systematic reviews

- Analogy with reporting of primary research
- Poorly reported systematic reviews
  - May not be suitable for use in clinical guidelines
- Evidence of poor reporting motivated elaboration of PRISMA Statement (following on QUOROM)

Knowledge generation cycle (2)



MECIR

Methodological Expectations of Cochrane Intervention Reviews (MECIR)

Standards for the reporting of new Cochrane Intervention Reviews

24 September 2012

- Complementary to PRISMA Statement
- List of 108 (!) items
- Distinction of status: mandatory / highly desirable

- www.editorial-unit.cochrane.org/mecir

MECIR

Status: Mandatory means that a new review should not be published if this is not reported.
Highly desirable means that this should generally be done, but that there are justifiable exceptions.

Item no.	Status	Item name	Standard	Rationale and elaboration
Title and authors				
1	Highly desirable	Format of title	Follow the standard template for a Cochrane review title.	See *Handbook* Table 4.2.a.
2	Mandatory	Authors	List names and affiliations of all authors	See *Handbook* 4.2.2.
Abstract				
3	Mandatory	Writing the abstract	Prepare a structured abstract to provide a succinct summary of the review. In the interests of brevity it is highly desirable for authors to provide an abstract of less than 700 words, and it should be no more than 1000 words in length.	Abstracts are a prominent, publically accessible summary of the review. They should convey key information about the review question and its findings, and be informative to readers. [PRISMA item 2]
4	Mandatory	Abstract, Background	Summarize the rationale and context of the review.	See *Handbook* 11.8
5	Mandatory	Abstract, Objectives	State the main objective(s), preferably in a single concise sentence	The objective(s) should be expressed in terms that relate to the population(s), intervention comparison(s) and, where appropriate, outcomes of interest. See *Handbook* 11.8
6	Mandatory	Abstract, Search methods	Provide the date of the last search from which records were evaluated and any studies identified were incorporated into the review, and an indication of the databases and other sources searched.	Abstracts should aim to give readers brief but key information about the comprehensiveness of the search and the currency of the information summarised by the review. The abstract must include the month and year of the set of searches up to which the conclusions of the review are valid. This date should reflect the date of the most recent set of searches from which all records have been screened for relevance and any studies meeting the eligibility criteria have been fully incorporated into the review (studies may be awaiting classification if, for example, the review authors are awaiting translation or clarification from authors or sponsors). Abstracts do not need to report on recent repeat or 'catch-up' searches whose results have not been fully incorporated into the review. However, discretion should be applied if such searches identify a large body of evidence whose absence from the review findings may affect the reliability of the conclusions. The amount of information regarding the search should be indicative of the process rather than provide specific details. In the interests of brevity certain details regarding the overall process may need to be moved to the full text of the review. Example: "CENTRAL, MEDLINE, Embase, five other databases and three trials registers were searched on [date] together with reference checking, citation searching and contact with study authors to identify additional studies".

Garbage in…


LITTER ONLY
NO HOUSEHOLD TRASH
NO BUSINESS TRASH
$100 FINE
Shopping

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