
Benchmarking and Evaluating the Interpretation of Bibliographic Records

Joffrey Decourselle · Fabien Duchateau · Trond Aalberg · Naimdjon Takhilov · Nicolas Lumineau

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Abstract In a global context which promotes the use of explicit semantics for sharing information and developing new services, the MAchine Readable Cataloguing (MARC) format that is commonly used by libraries worldwide has demonstrated its limitations. The semantic model for representing cultural items presented in the Functional Requirements for Bibliographic Records (FRBR) is expected to be a successor of MARC, and the complex transformation of MARC catalogs to FRBR catalogs (FRBRization) led to the proposition of various tools and approaches. However, these projects and the results they achieve are difficult to compare on a fair basis due to a lack of common datasets and appropriate metrics. Our contributions fill this gap by proposing the first public benchmark for the FRBRization process.

Keywords benchmark · migration · record interpretation · FRBRization · LRM · FRBR · MARC · dataset · evaluation metric

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Note that this paper is an extension of a previous version published in TPDL 2016 [1].

1 Assessing strengths and weaknesses - results by test

This first experiment aims at demonstrating the benefit of the dataset T42 when it comes to evaluating the strengths and weaknesses of FRBRization tools. For the three tools, we have run each test from the dataset T42 and the evaluation is performed using post-FRBRization metrics. In other words, each tool has produced a FRBR collection for each test, and these generated FRBR collections have been compared to the expert ones provided in the benchmark. A basic set of rules is available with each tool. For equity reasons, we have not tuned the tools by updating their set of rules.

In the following plots, the results are organized by tool and by test.

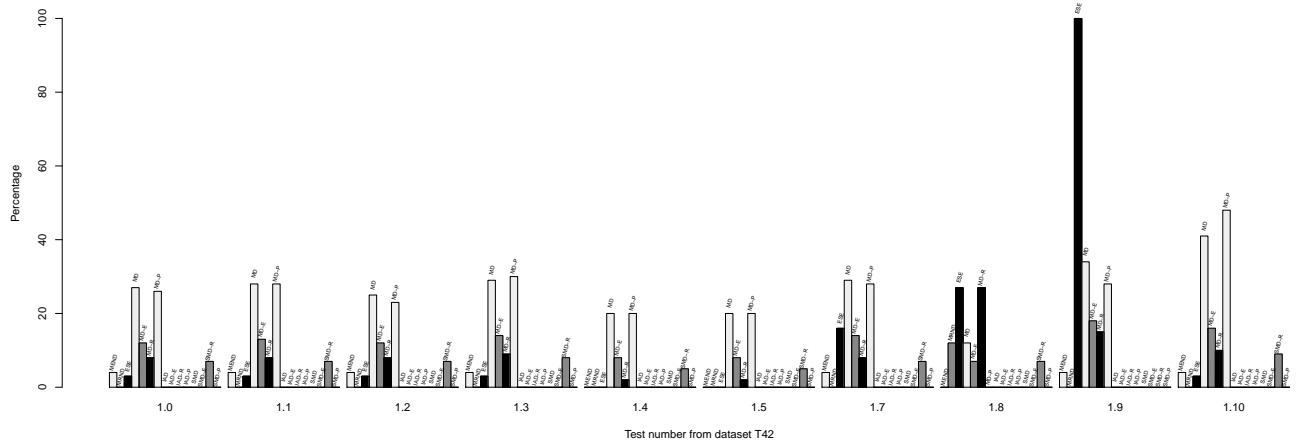


Fig. 1 Quality results for FRBR-ML with dataset T42 tests 1.x

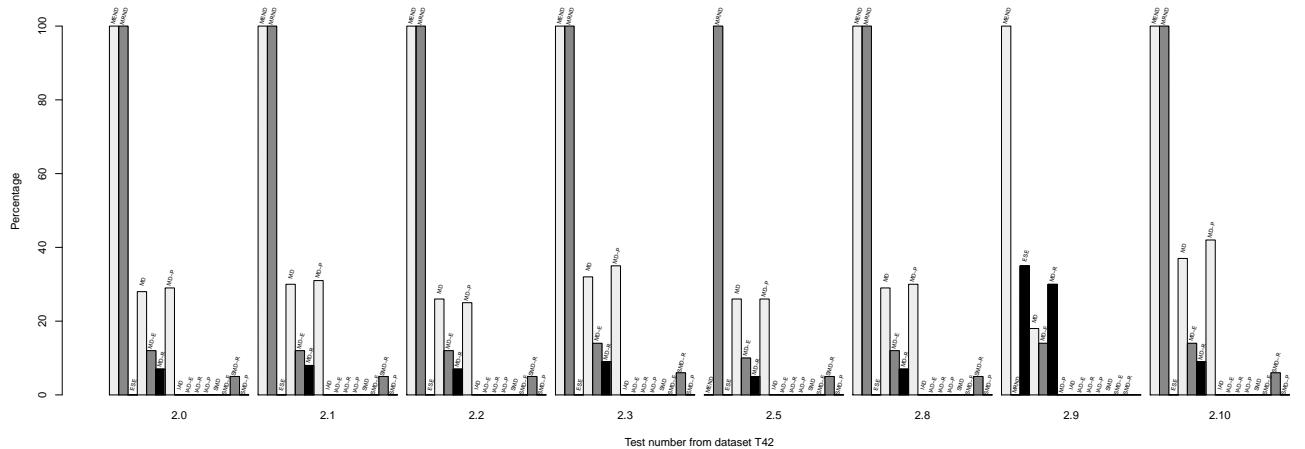


Fig. 2 Quality results for FRBR-ML with dataset T42 tests 2.x

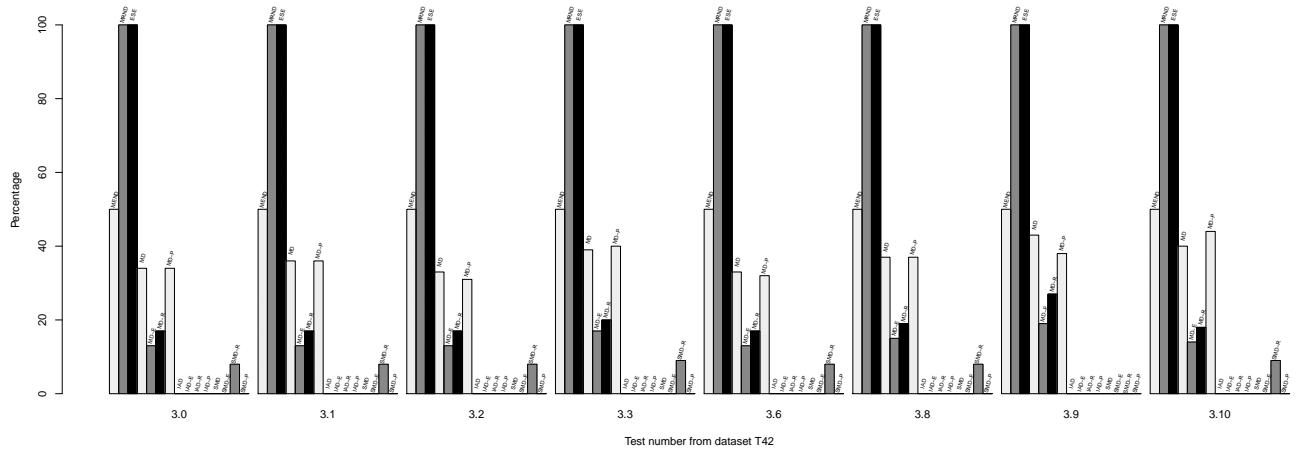


Fig. 3 Quality results for FRBR-ML with dataset T42 tests 3.x

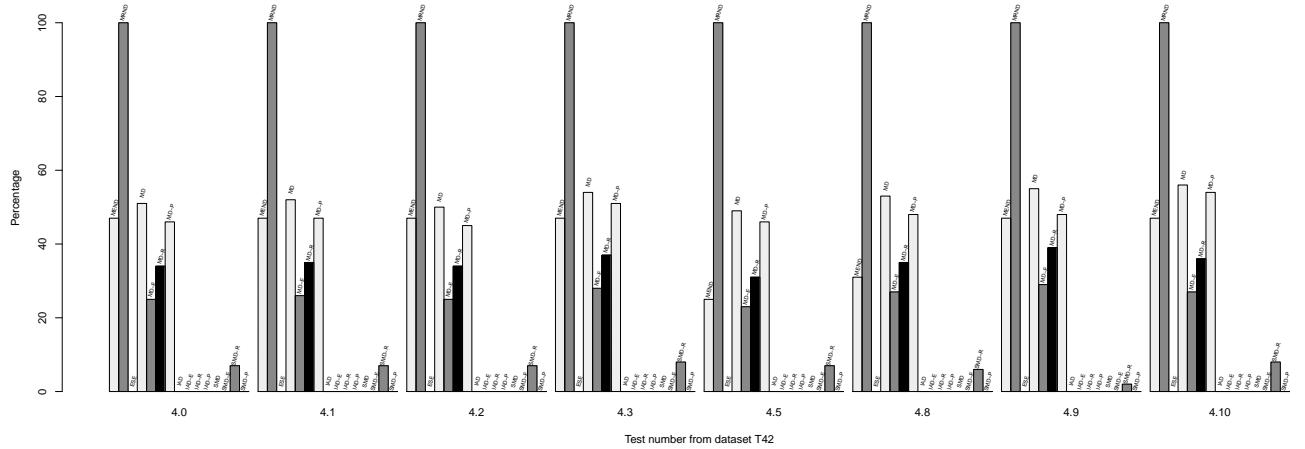


Fig. 4 Quality results for FRBR-ML with dataset T42 tests 4.x

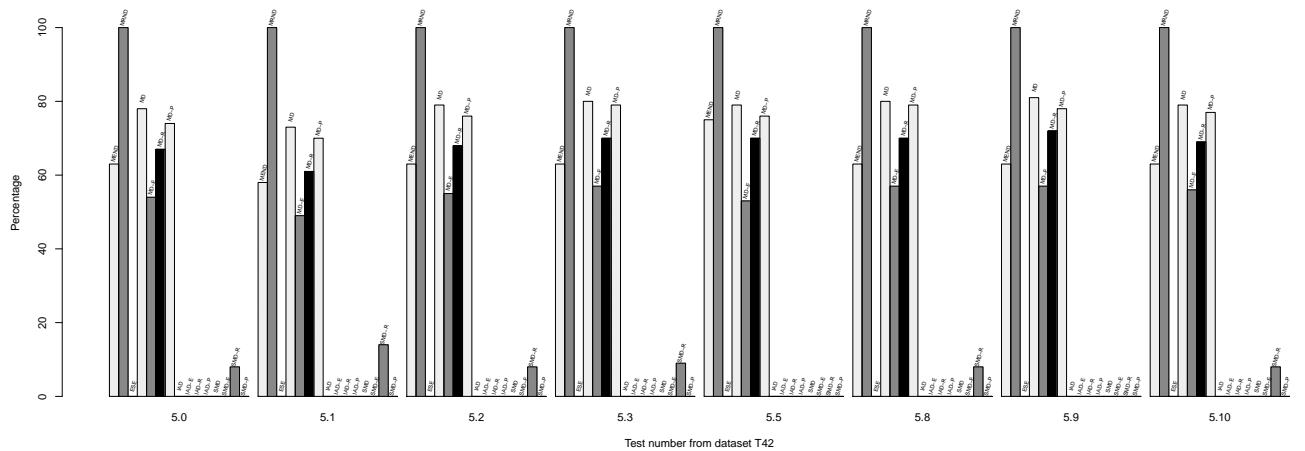


Fig. 5 Quality results for FRBR-ML with dataset T42 tests 5.x

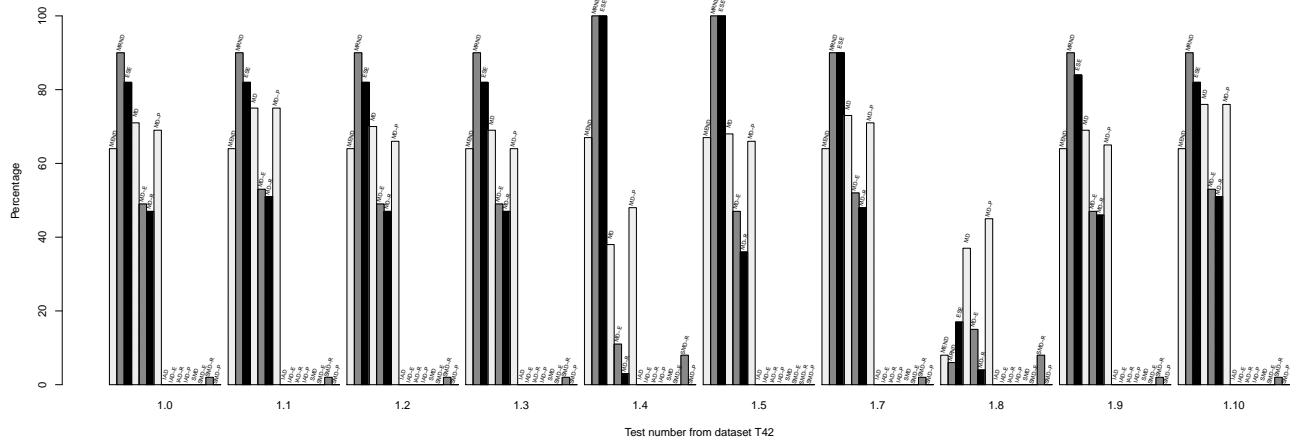


Fig. 6 Quality results for Variation/VFRBR with dataset T42 tests 1.x

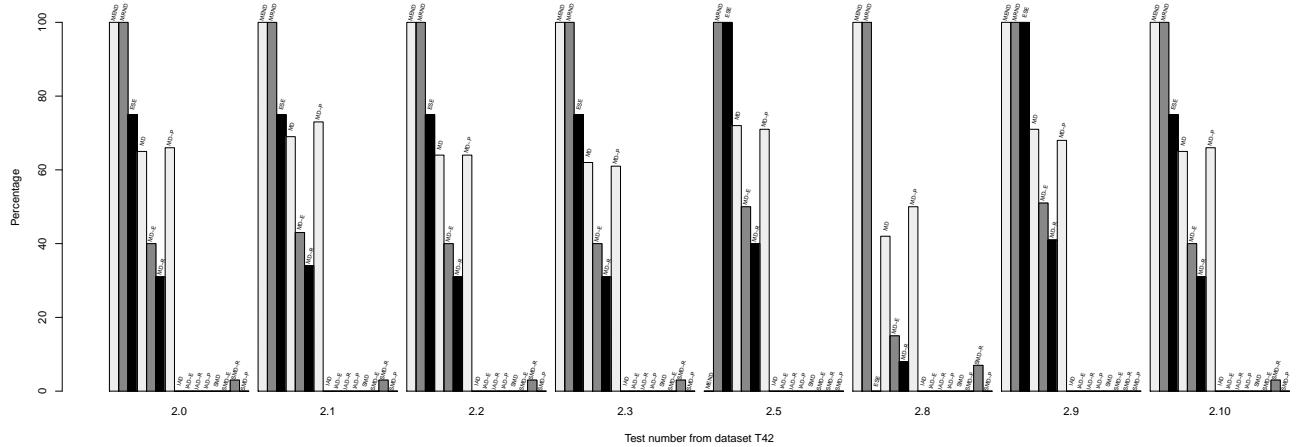


Fig. 7 Quality results for Variation/VFRBR with dataset T42 tests 2.x

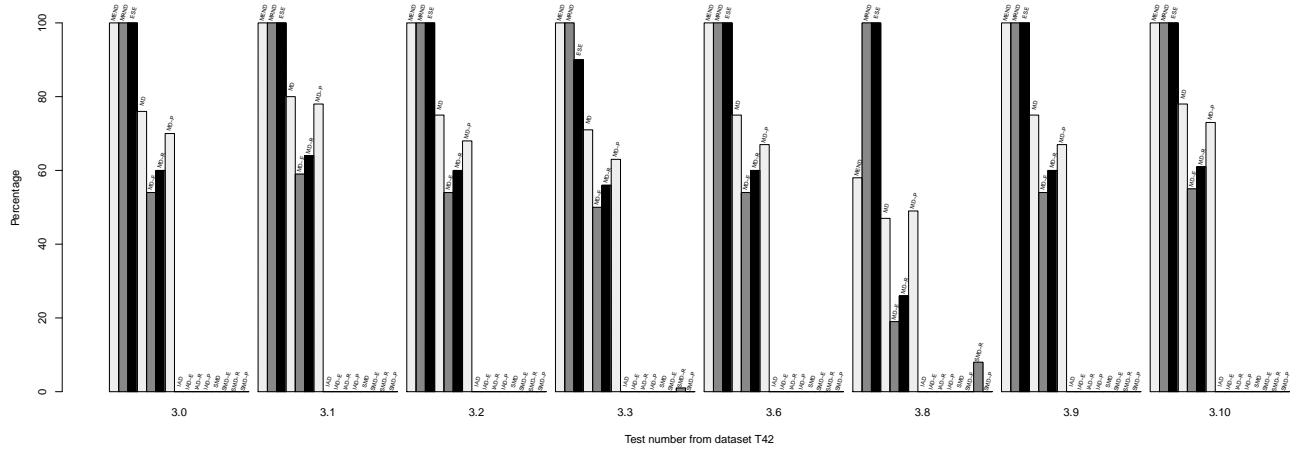


Fig. 8 Quality results for Variation/VFRBR with dataset T42 tests 3.x

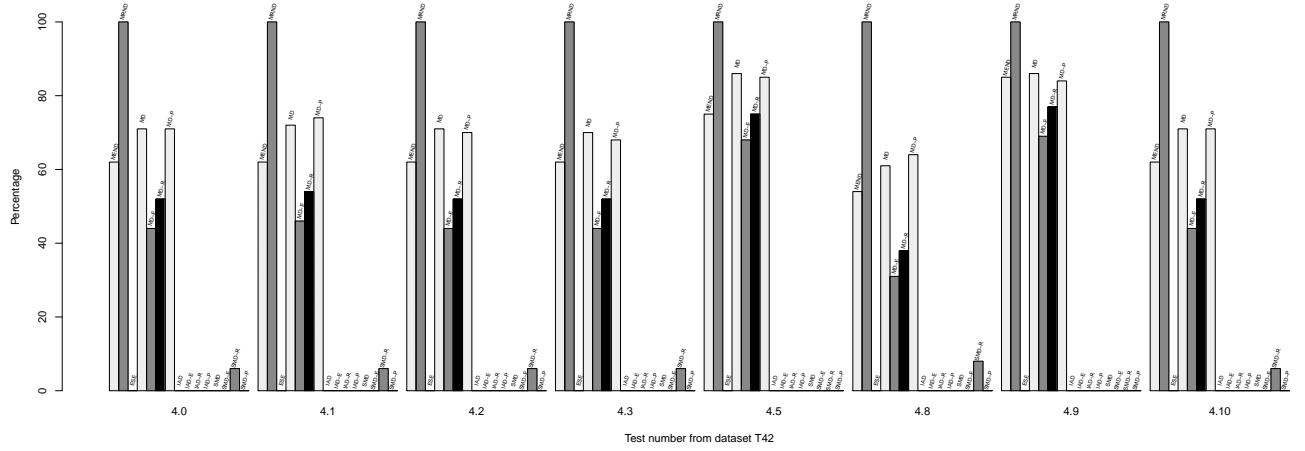


Fig. 9 Quality results for Variation/VFRBR with dataset T42 tests 4.x

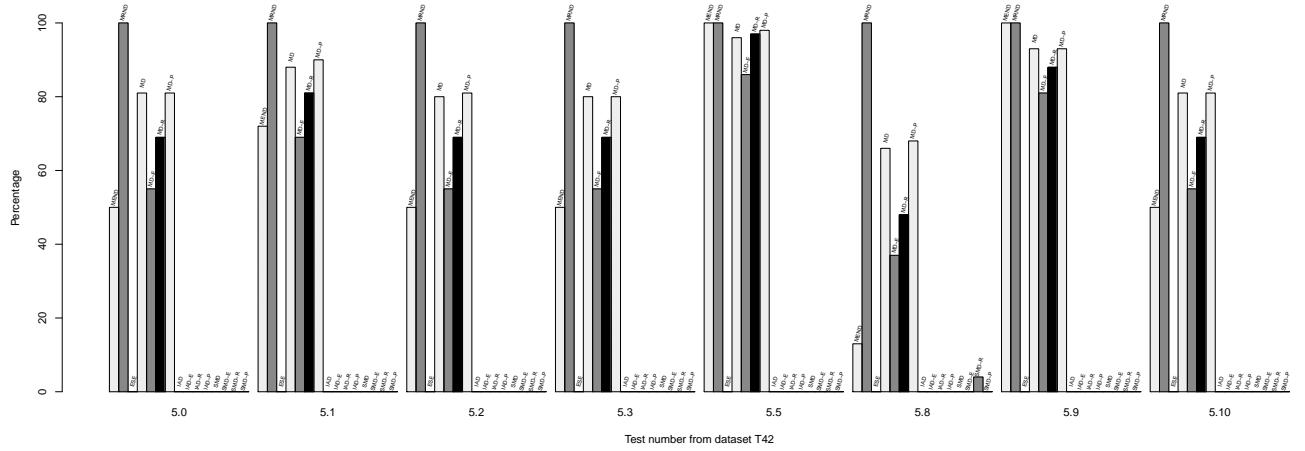


Fig. 10 Quality results for Variation/VFRBR with dataset T42 tests 5.x

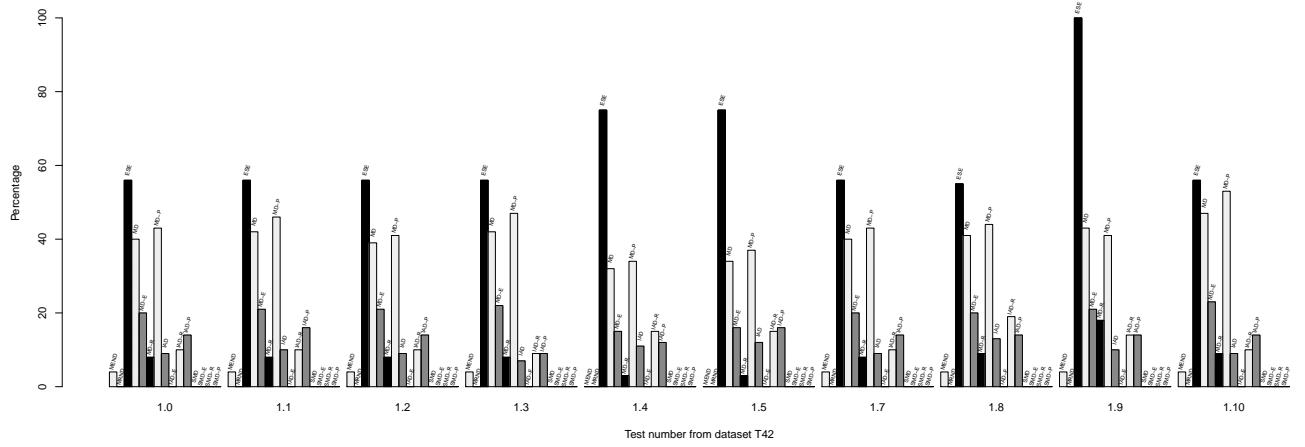


Fig. 11 Quality results for Extensible Catalog with dataset T42 tests 1.x

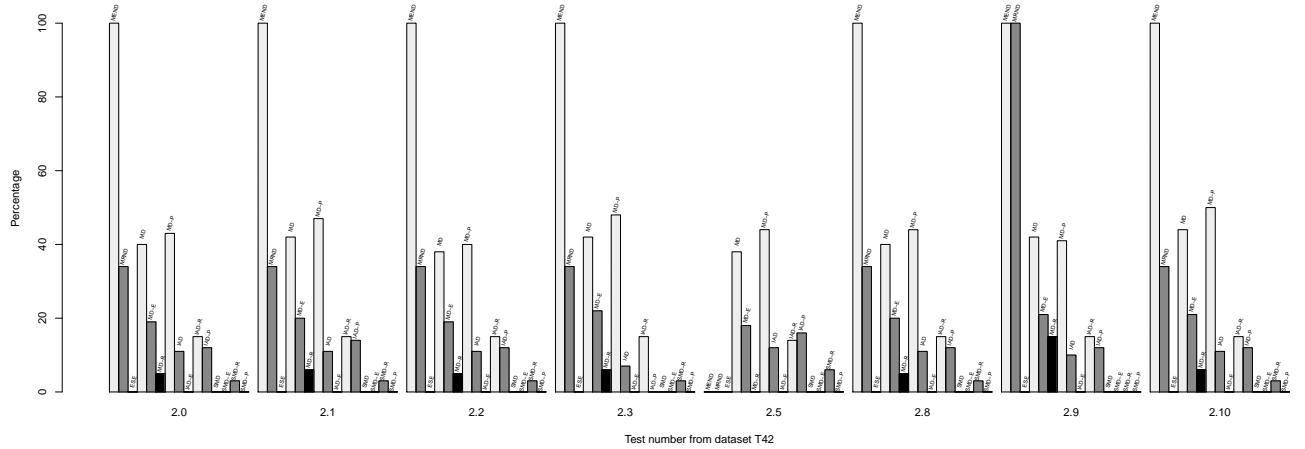


Fig. 12 Quality results for Extensible Catalog with dataset T42 tests 2.x

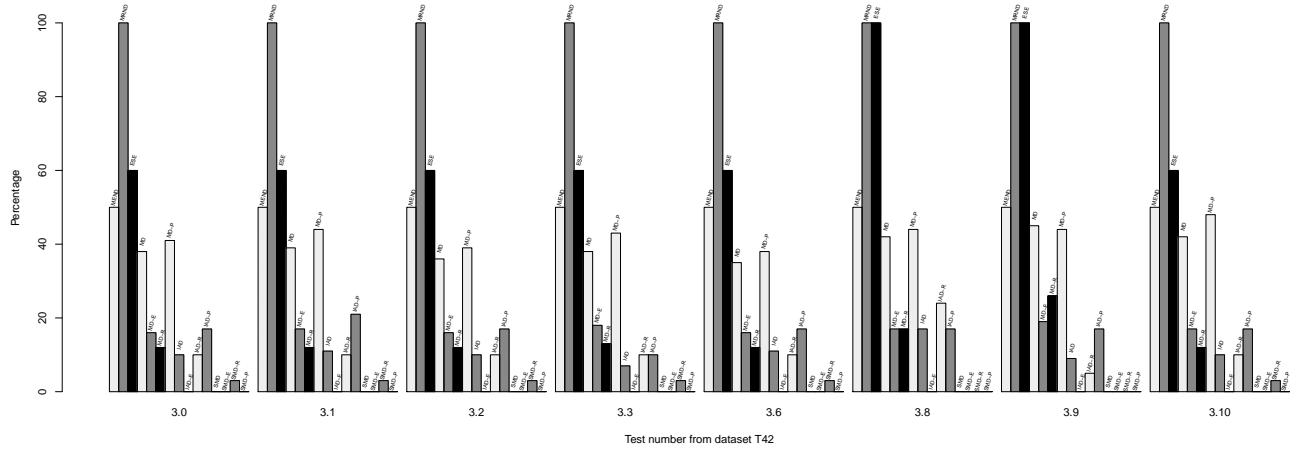


Fig. 13 Quality results for Extensible Catalog with dataset T42 tests 3.x

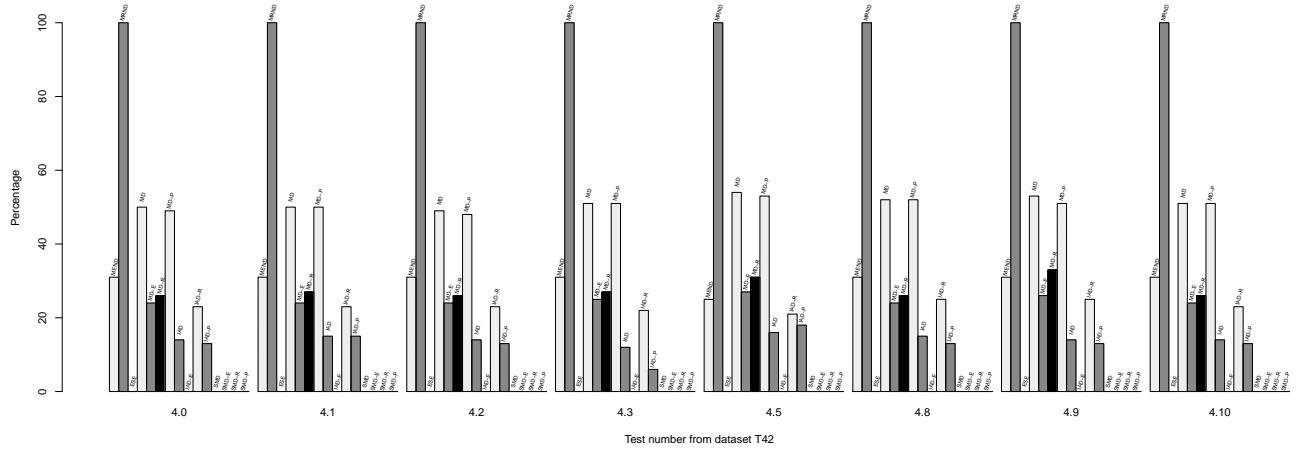


Fig. 14 Quality results for Extensible Catalog with dataset T42 tests 4.x

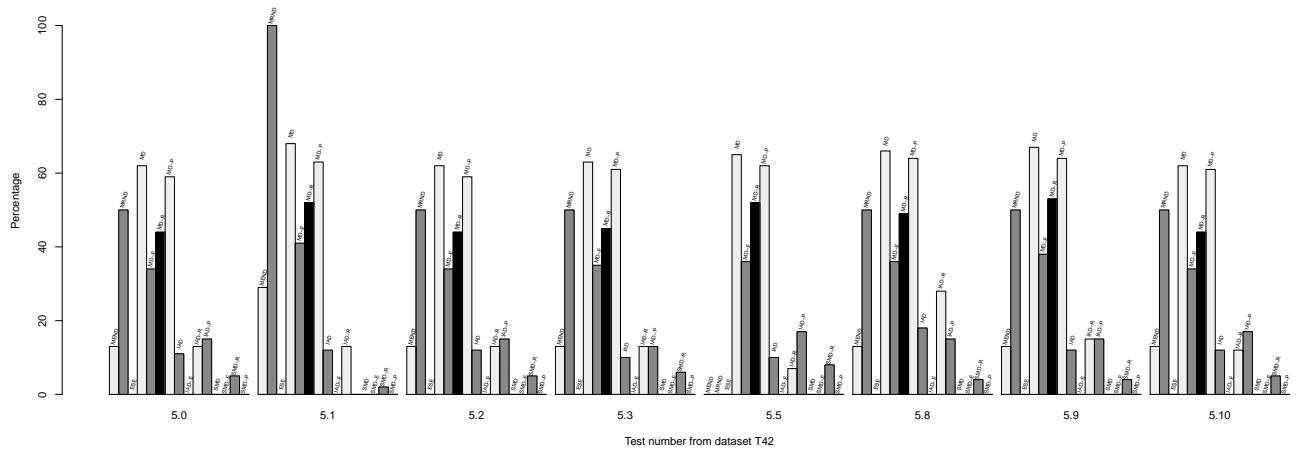


Fig. 15 Quality results for Extensible Catalog with dataset T42 tests 5.x

2 Assessing strengths and weaknesses - results by metric

This first experiment aims at demonstrating the benefit of the dataset T42 when it comes to evaluating the strengths and weaknesses of FRBRization tools. For the three tools, we have run each test from the dataset T42 and the evaluation is performed using post-FRBRization metrics. In other words, each tool has produced a FRBR collection for each test, and these generated FRBR collections have been compared to the expert ones provided in the benchmark. A basic set of rules is available with each tool. For equity reasons, we have not tuned the tools by updating their set of rules.

In the following plots, the results are organized by tool and by metric.

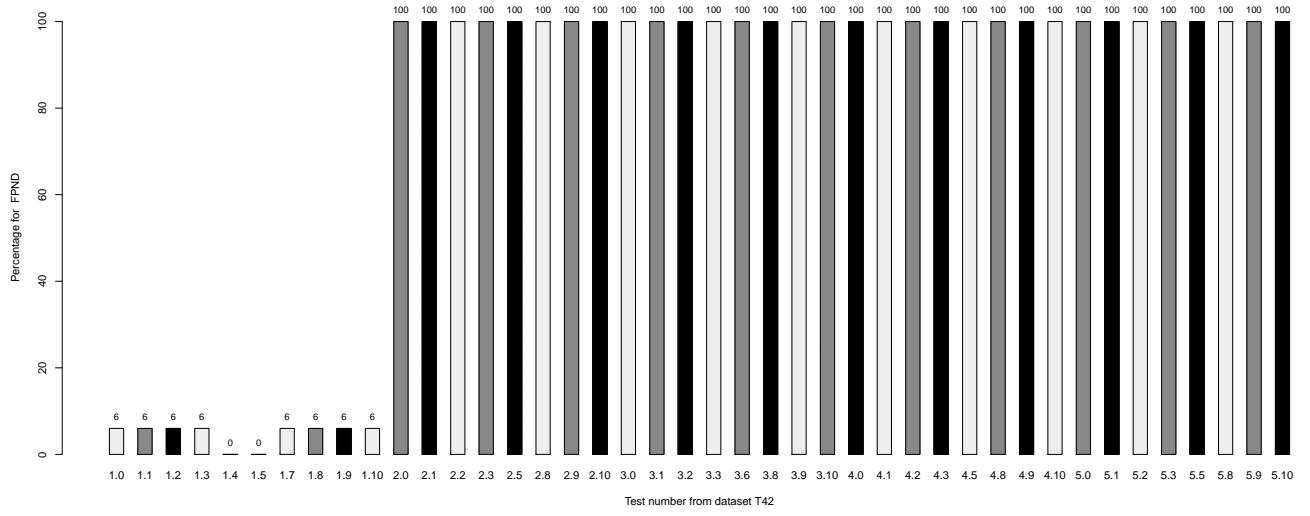


Fig. 16 Quality results for FRBR-ML with dataset T42 and metric FPND

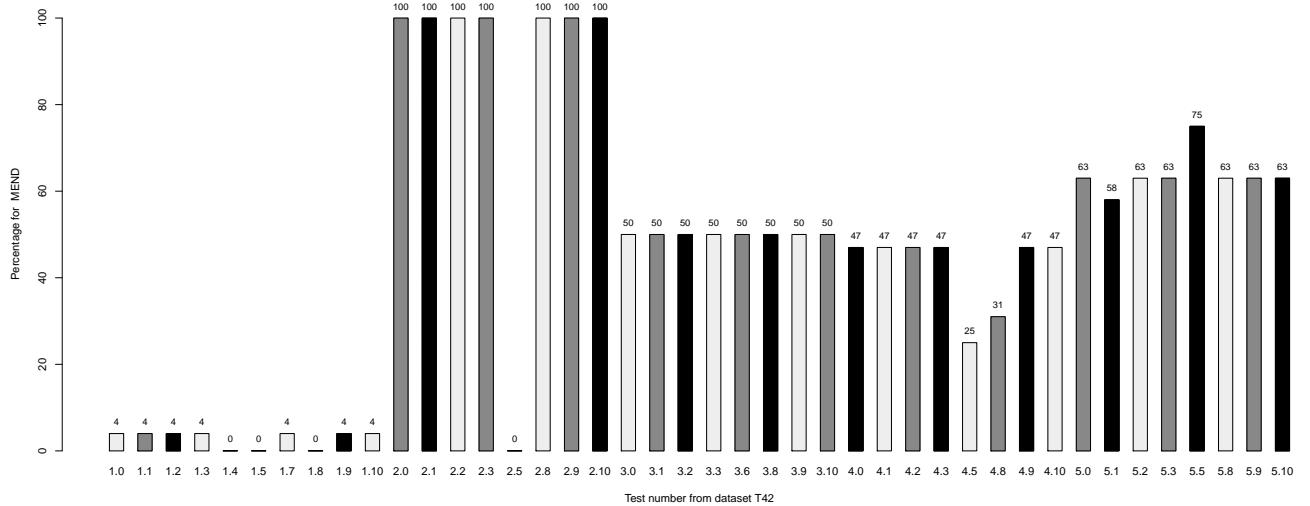
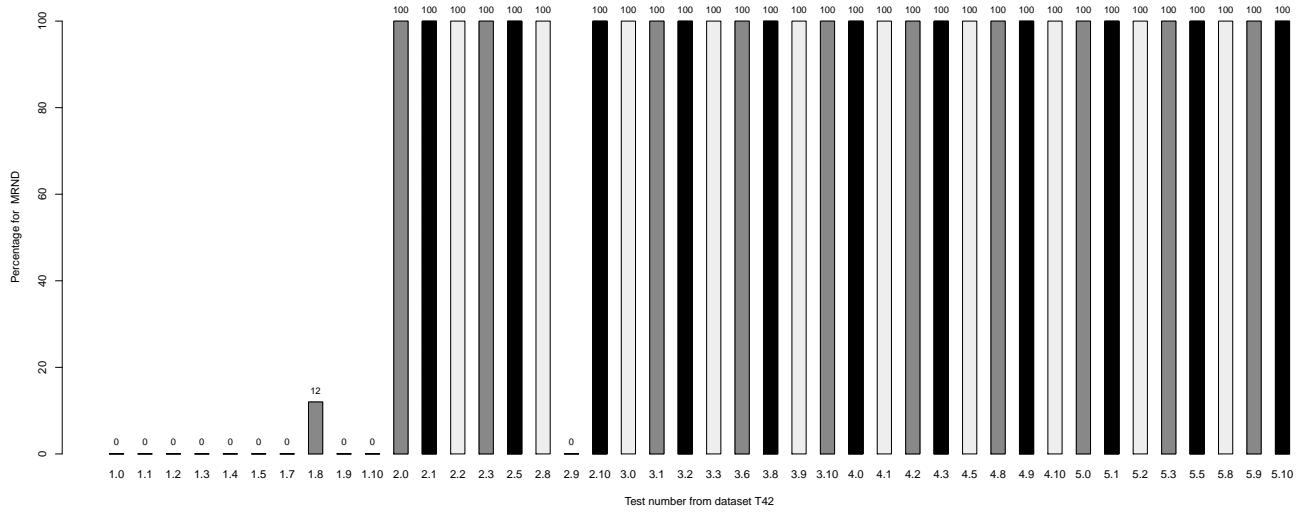
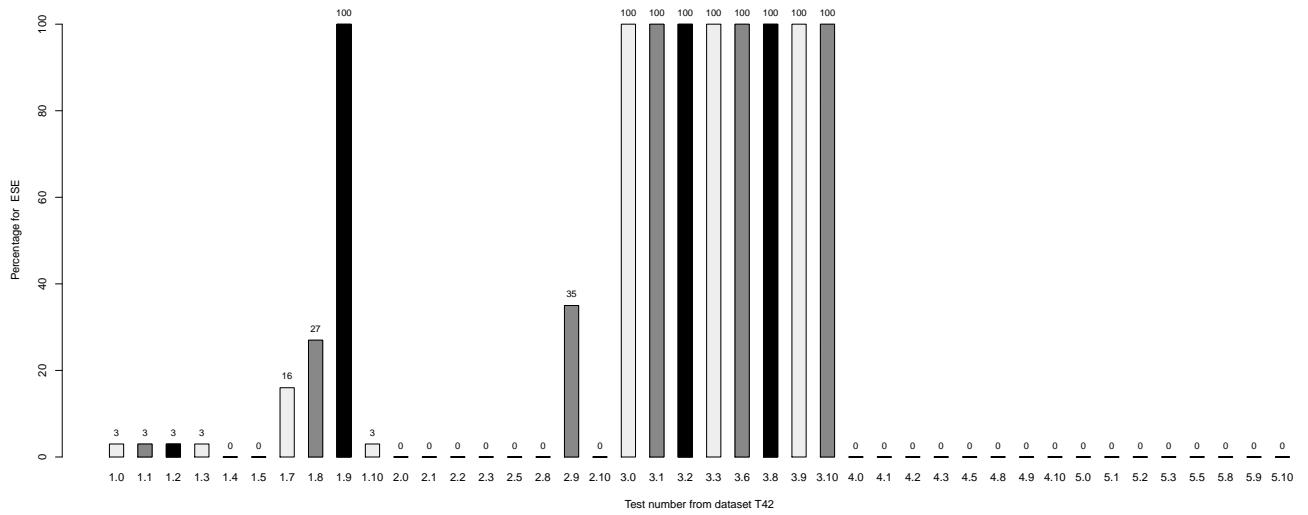


Fig. 17 Quality results for FRBR-ML with dataset T42 and metric MEND

**Fig. 18** Quality results for FRBR-ML with dataset T42 and metric MRND**Fig. 19** Quality results for FRBR-ML with dataset T42 and metric ESE

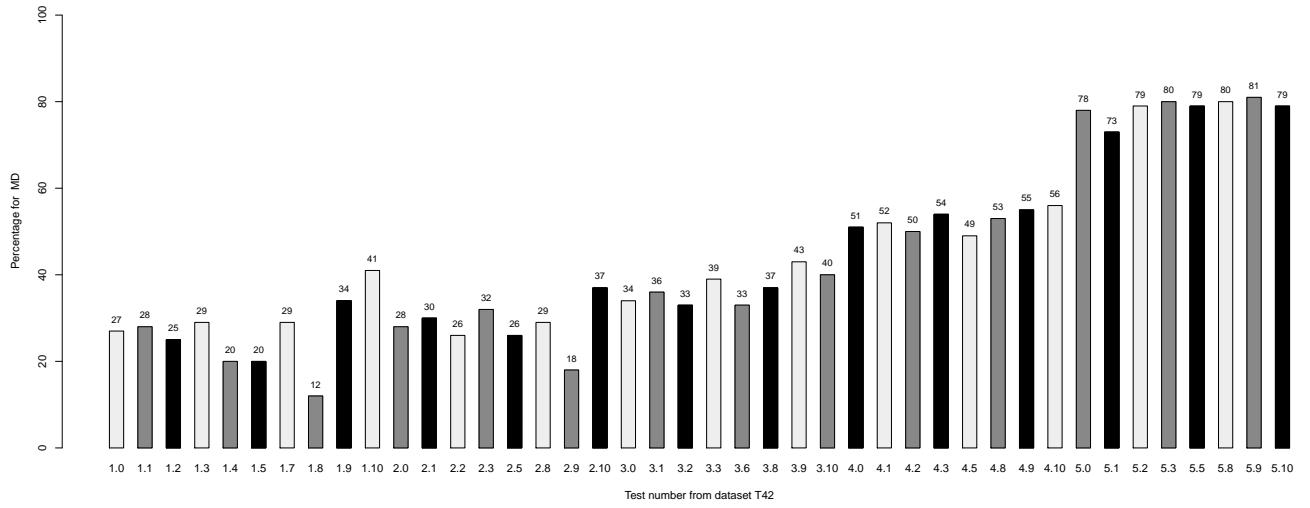


Fig. 20 Quality results for FRBR-ML with dataset T42 and metric MD

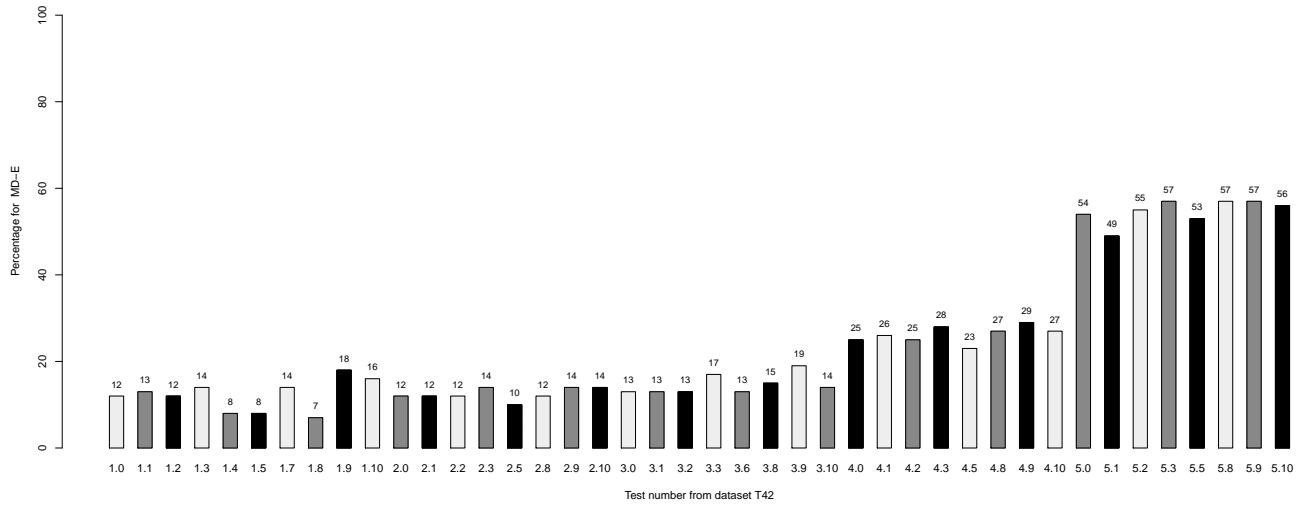
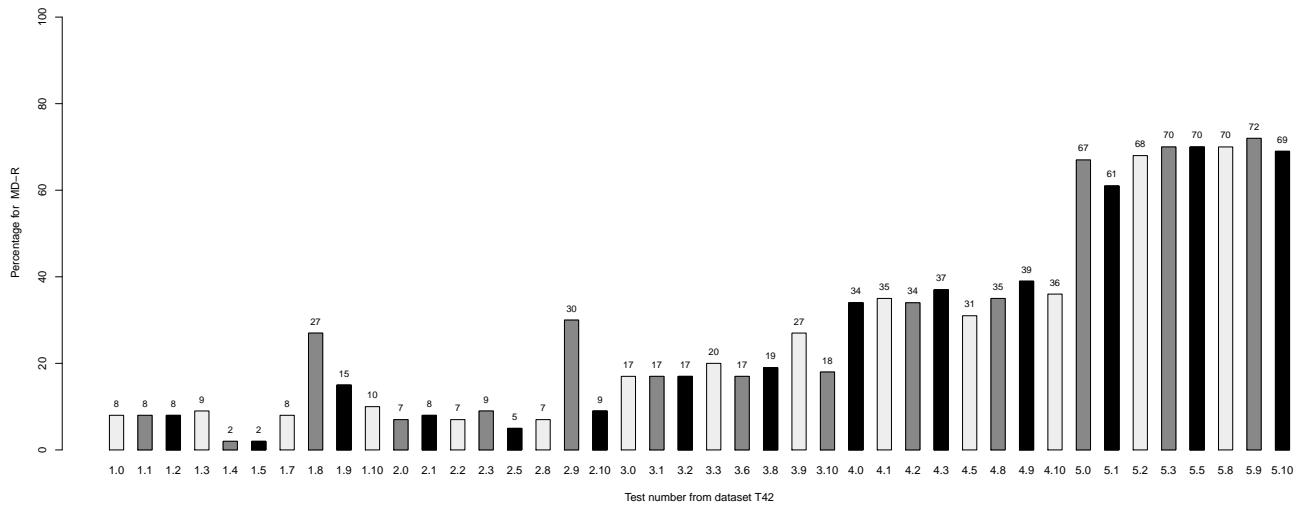
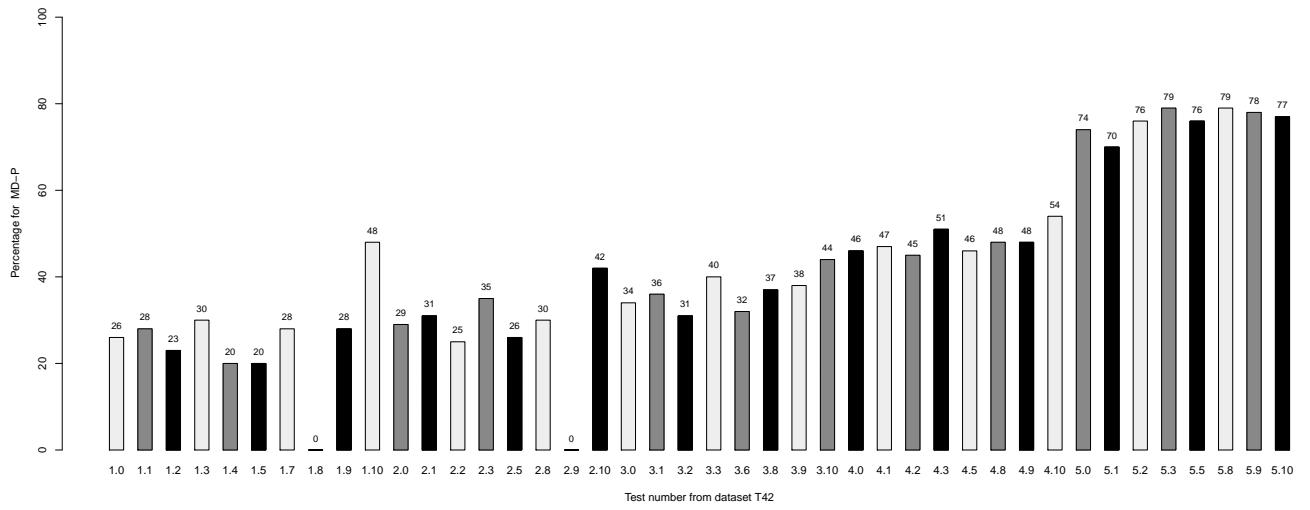


Fig. 21 Quality results for FRBR-ML with dataset T42 and metric MD-E

**Fig. 22** Quality results for FRBR-ML with dataset T42 and metric MD-R**Fig. 23** Quality results for FRBR-ML with dataset T42 and metric MD-P

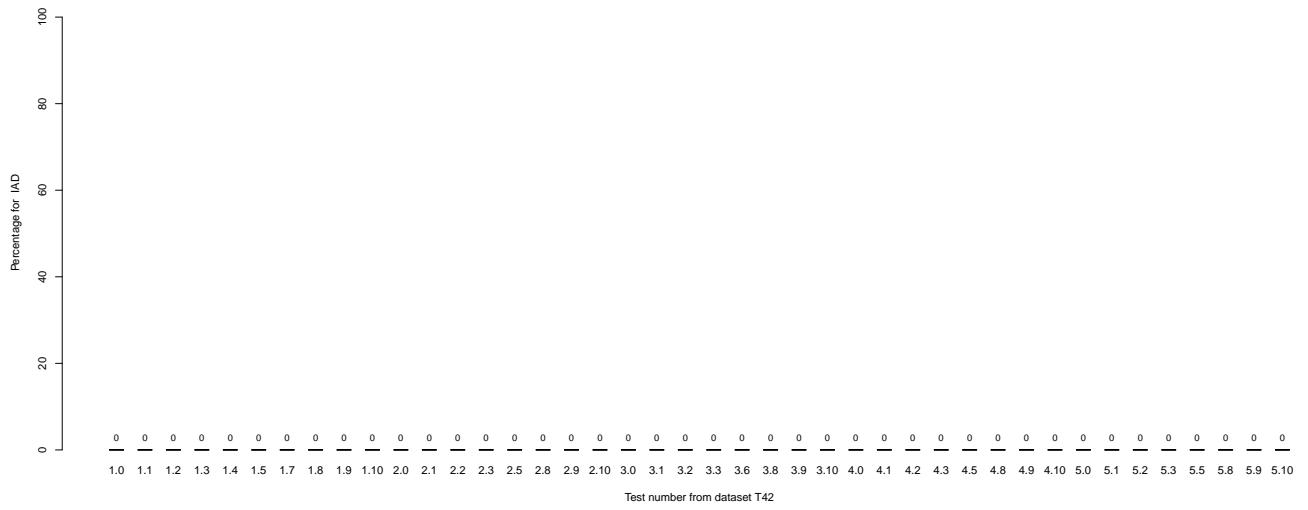


Fig. 24 Quality results for FRBR-ML with dataset T42 and metric IAD

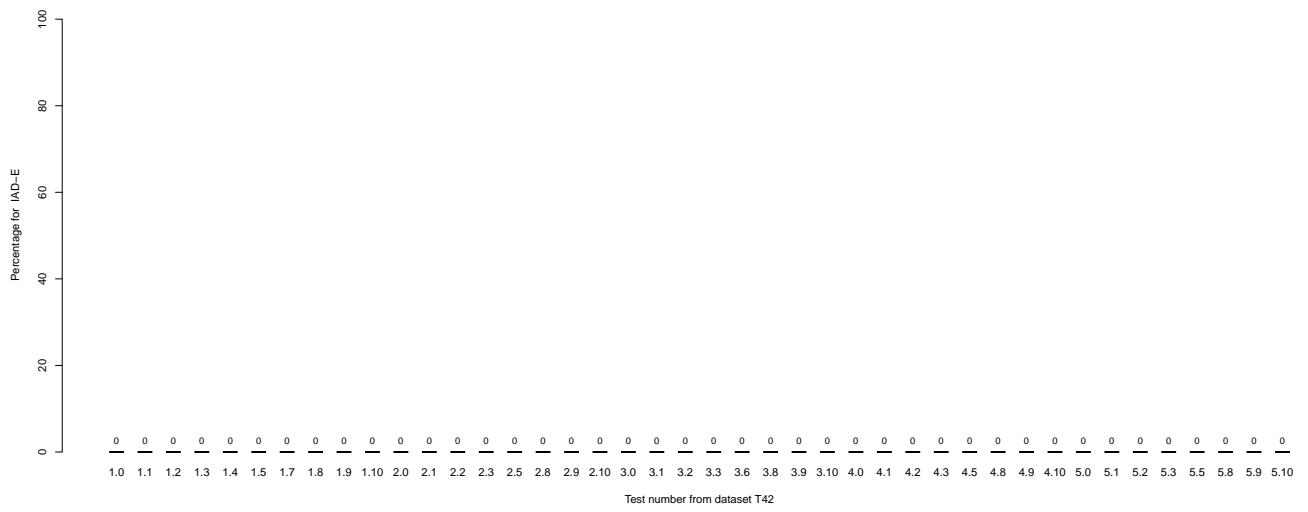


Fig. 25 Quality results for FRBR-ML with dataset T42 and metric IAD-E

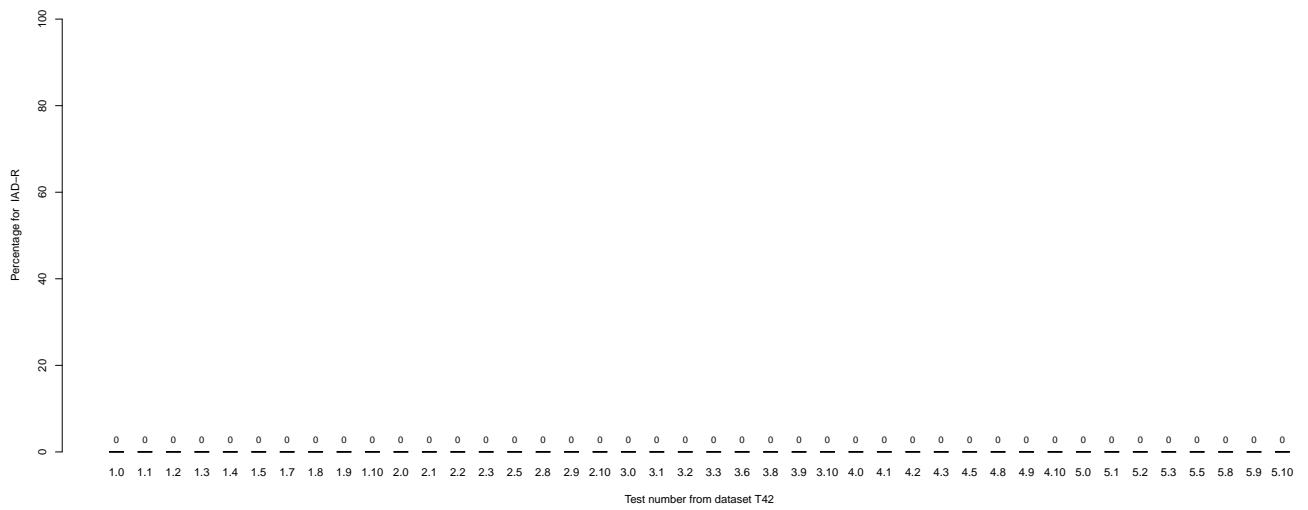


Fig. 26 Quality results for FRBR-ML with dataset T42 and metric IAD-R

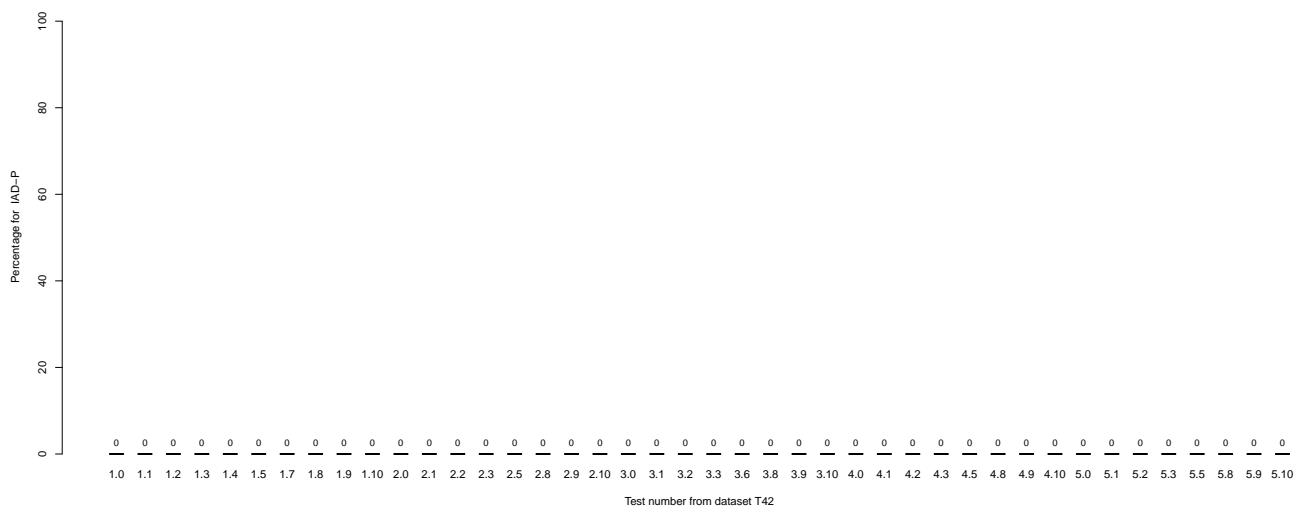


Fig. 27 Quality results for FRBR-ML with dataset T42 and metric IAD-P

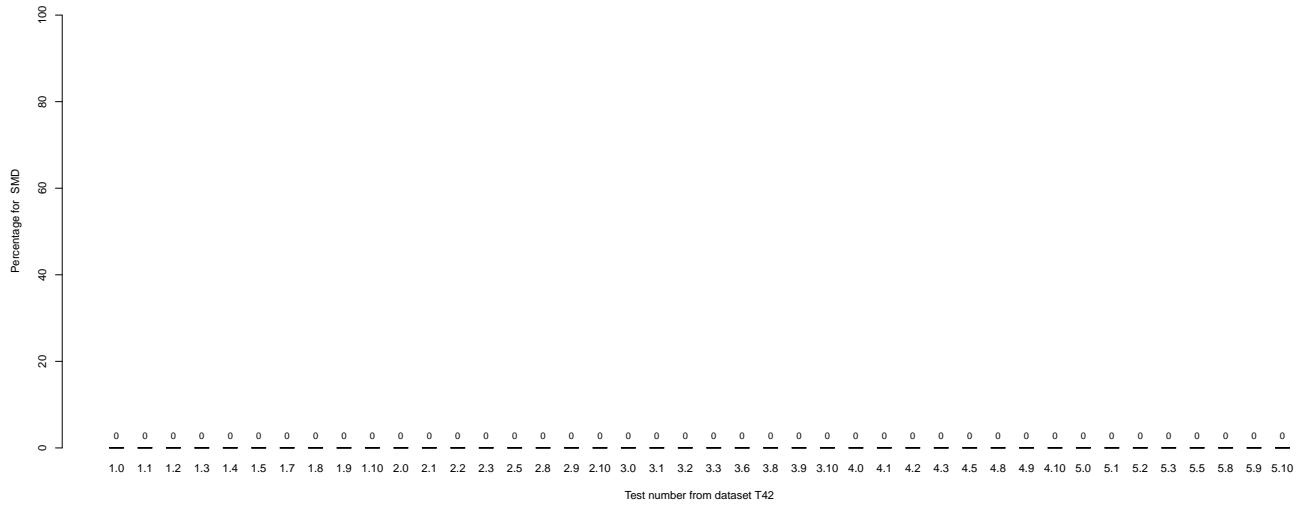


Fig. 28 Quality results for FRBR-ML with dataset T42 and metric SMD

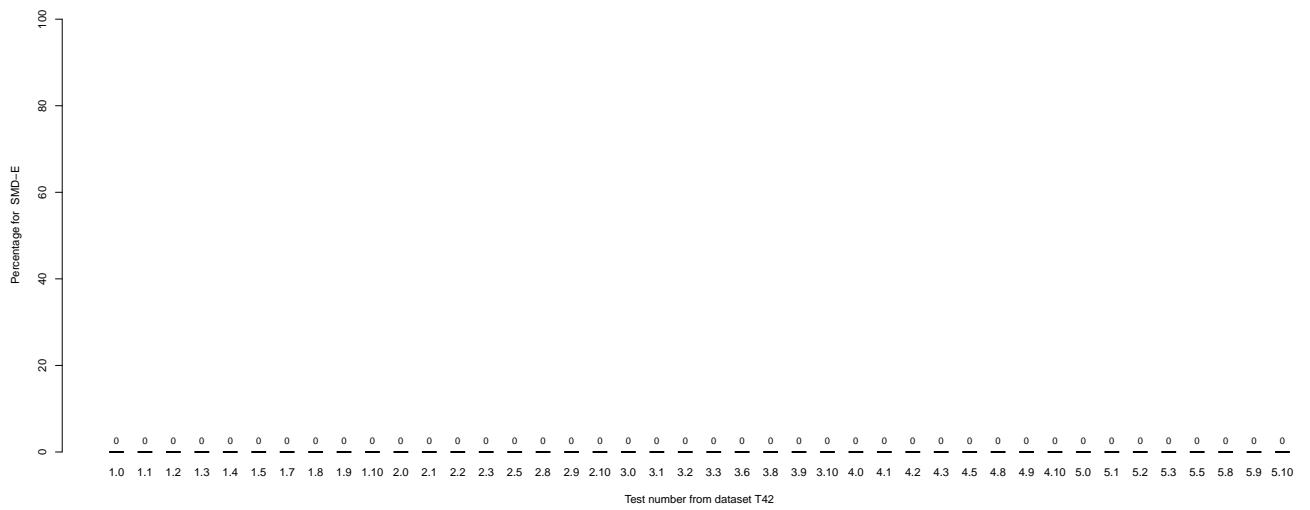
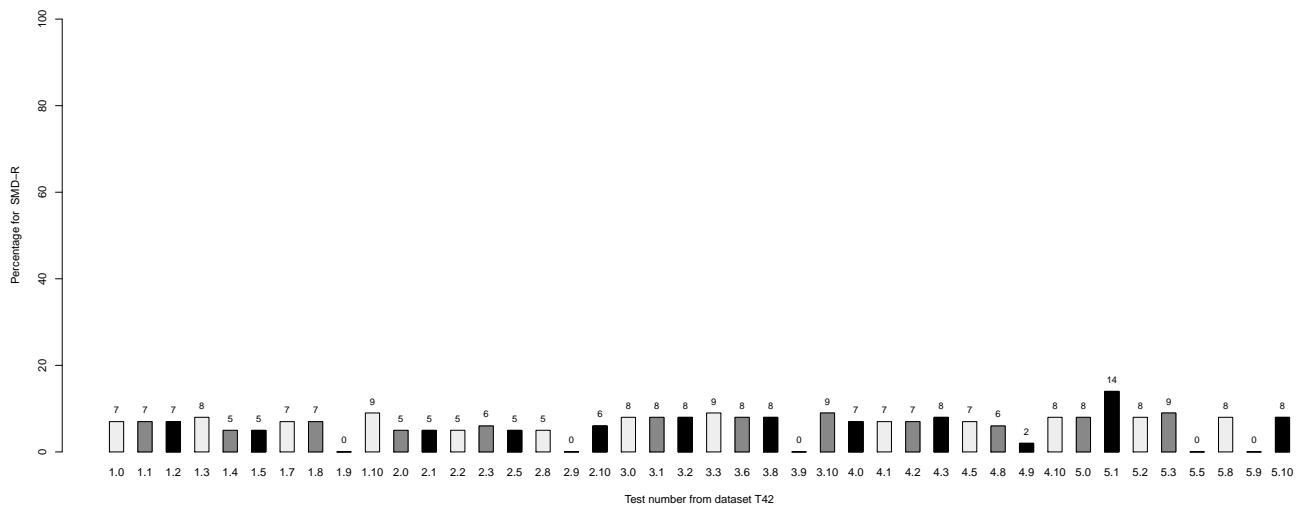
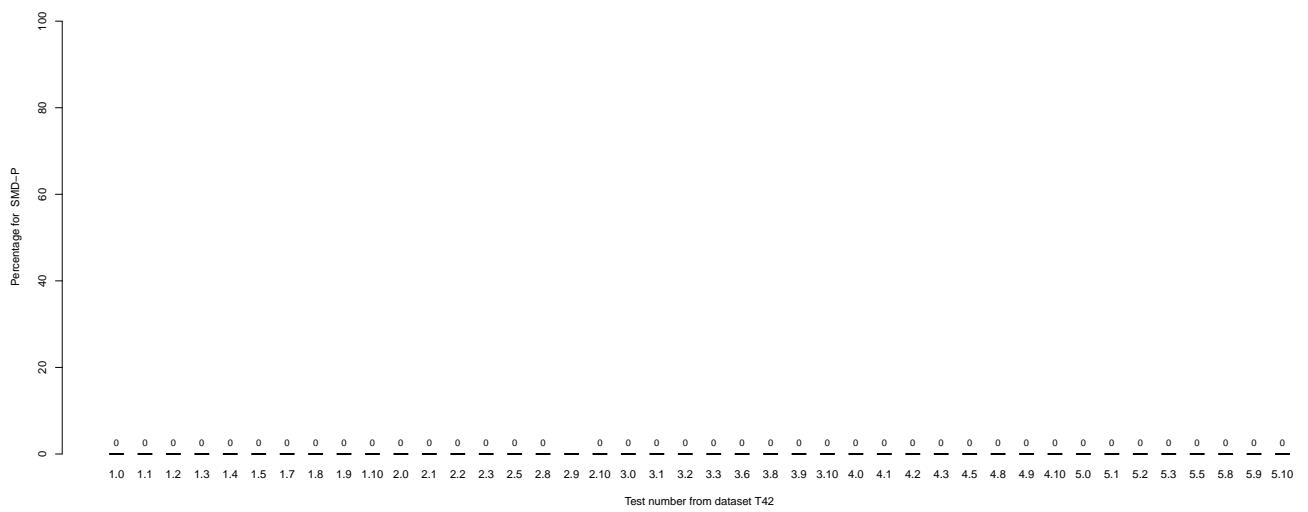


Fig. 29 Quality results for FRBR-ML with dataset T42 and metric SMD-E

**Fig. 30** Quality results for FRBR-ML with dataset T42 and metric SMD-R**Fig. 31** Quality results for FRBR-ML with dataset T42 and metric SMD-P

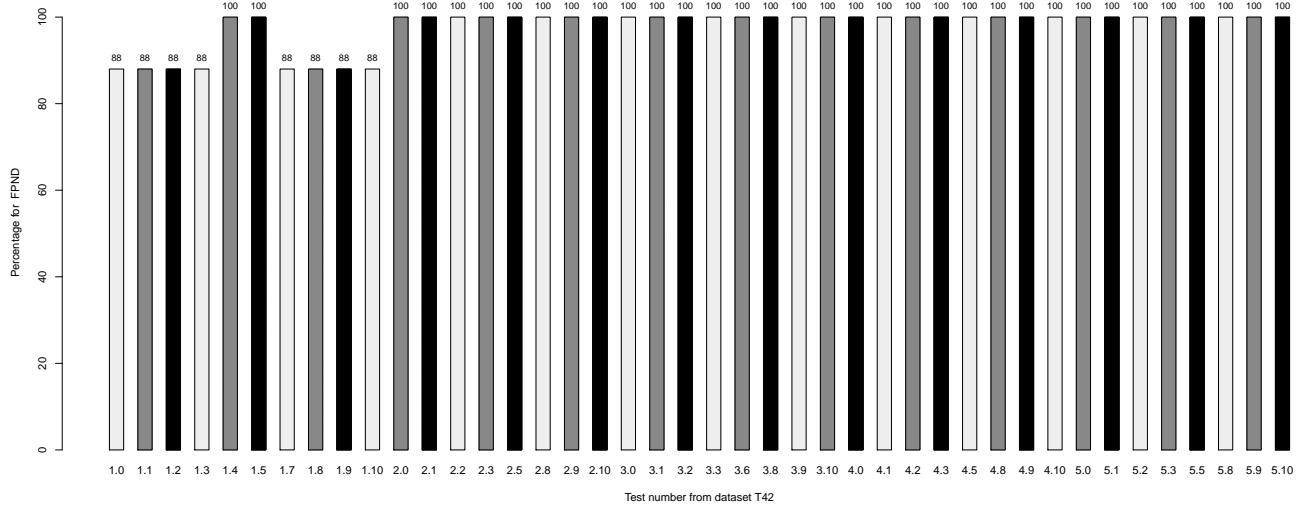


Fig. 32 Quality results for Variation/VFRBR with dataset T42 and metric FPND

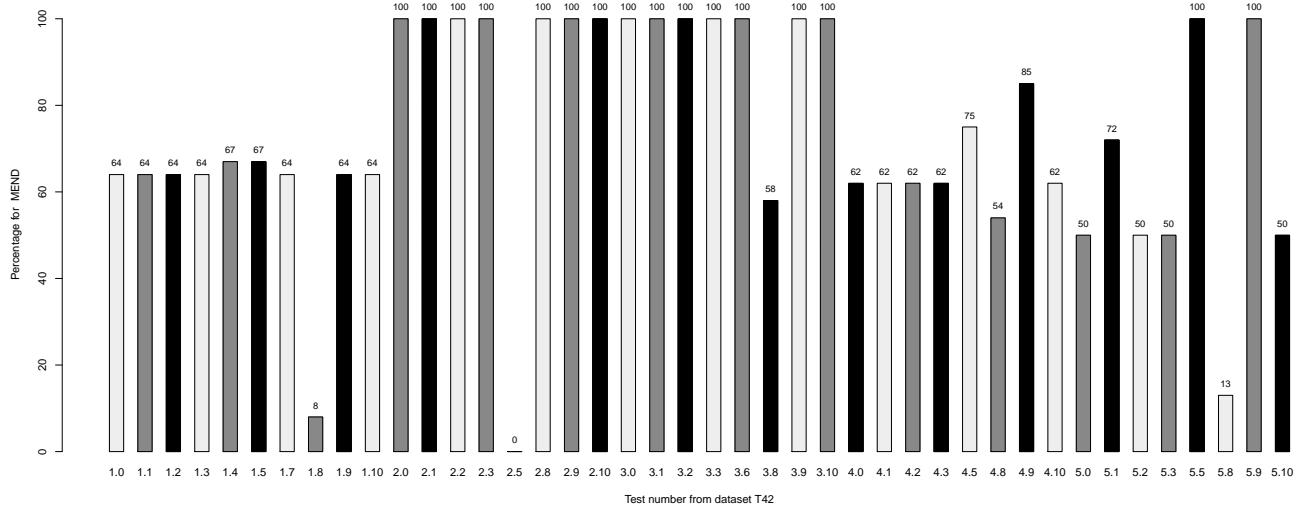


Fig. 33 Quality results for Variation/VFRBR with dataset T42 and metric MEND

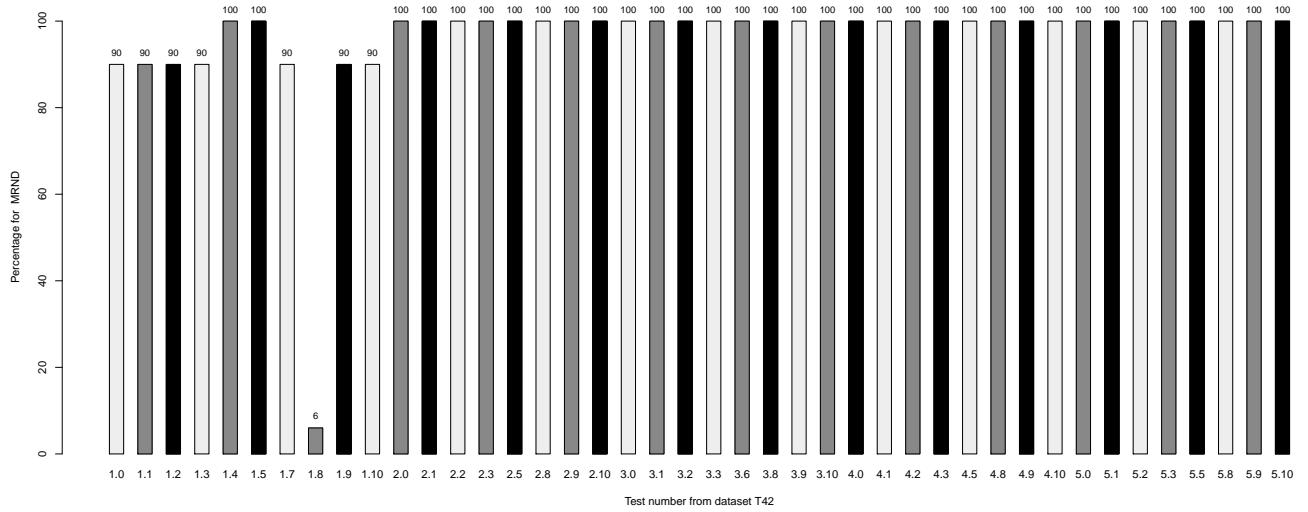


Fig. 34 Quality results for Variation/VFRBR with dataset T42 and metric MRND

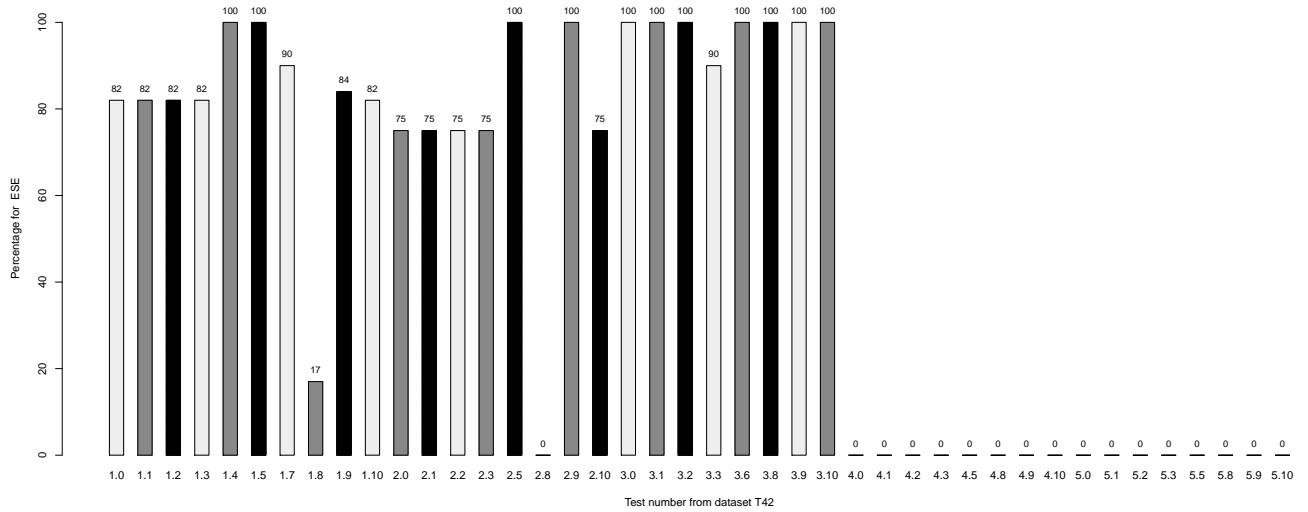


Fig. 35 Quality results for Variation/VFRBR with dataset T42 and metric ESE

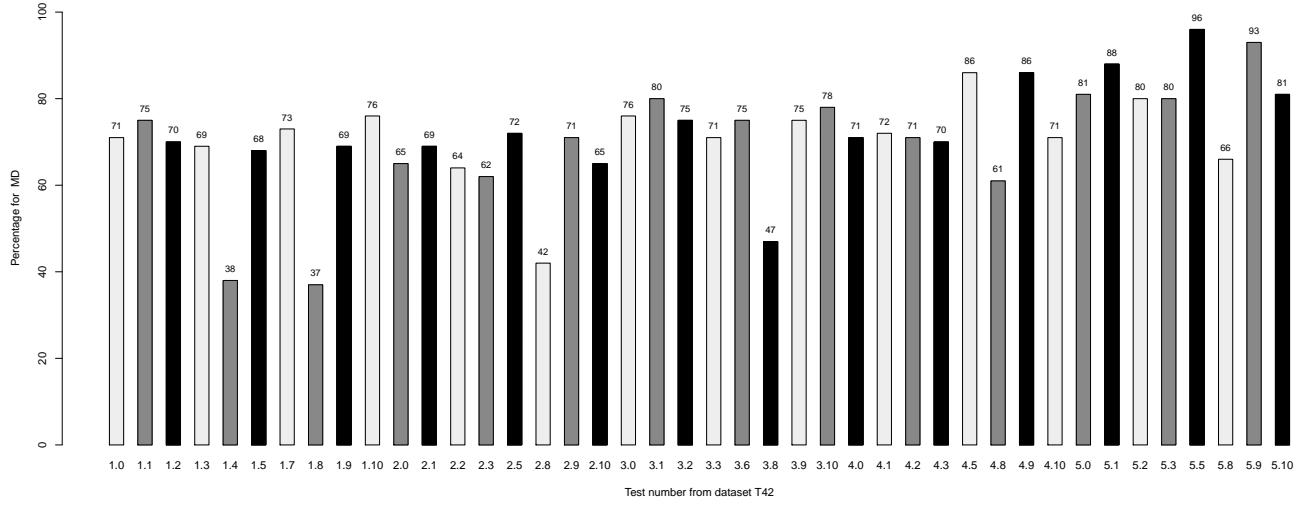


Fig. 36 Quality results for Variation/VFRBR with dataset T42 and metric MD

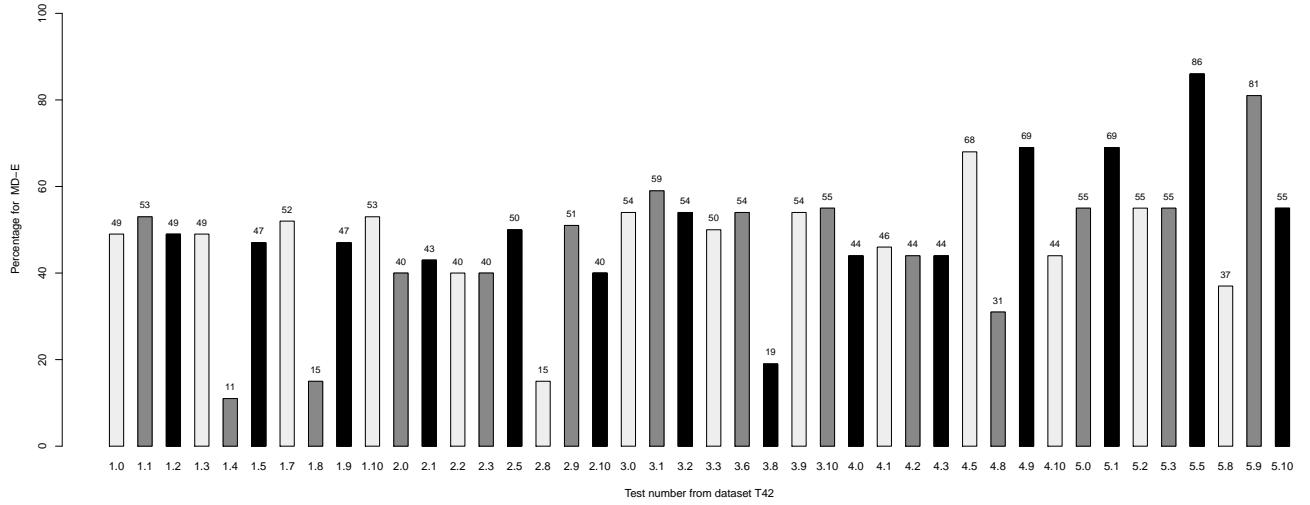
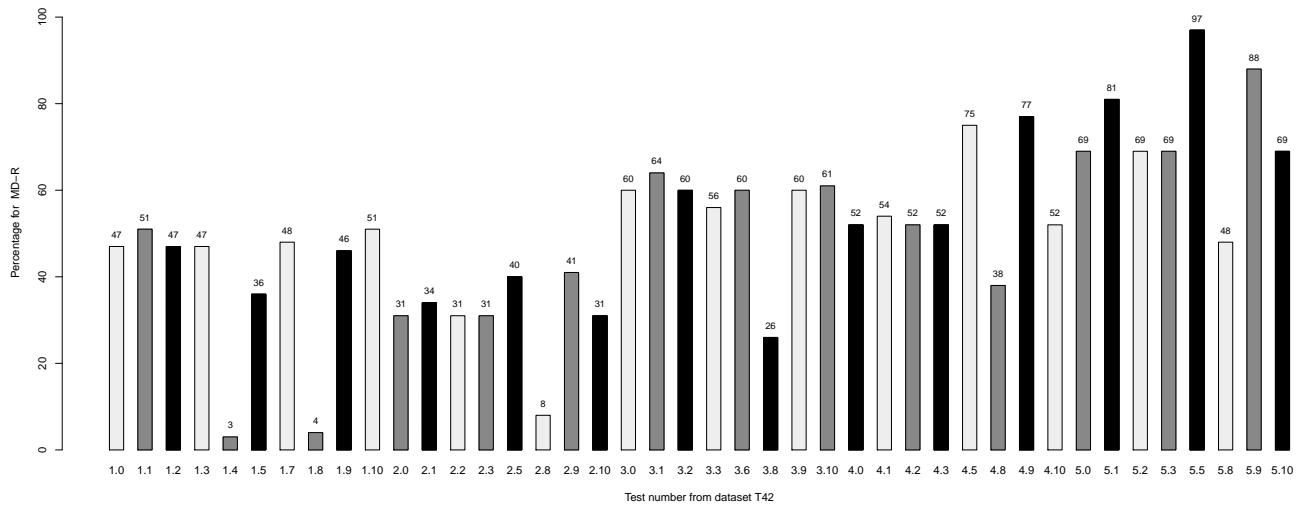
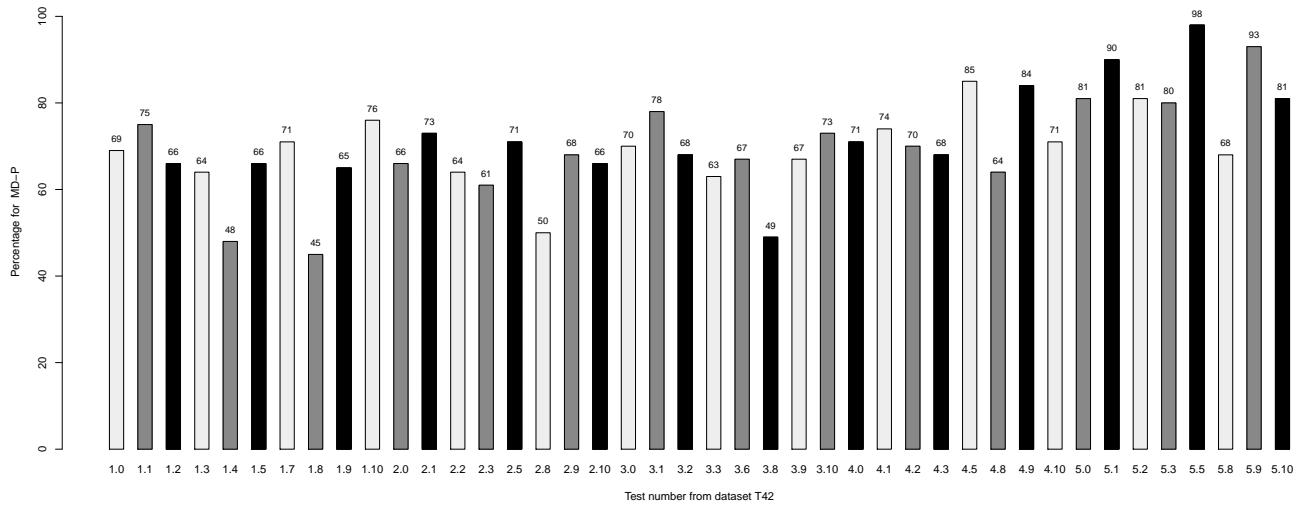


Fig. 37 Quality results for Variation/VFRBR with dataset T42 and metric MD-E

**Fig. 38** Quality results for Variation/VFRBR with dataset T42 and metric MD-R**Fig. 39** Quality results for Variation/VFRBR with dataset T42 and metric MD-P

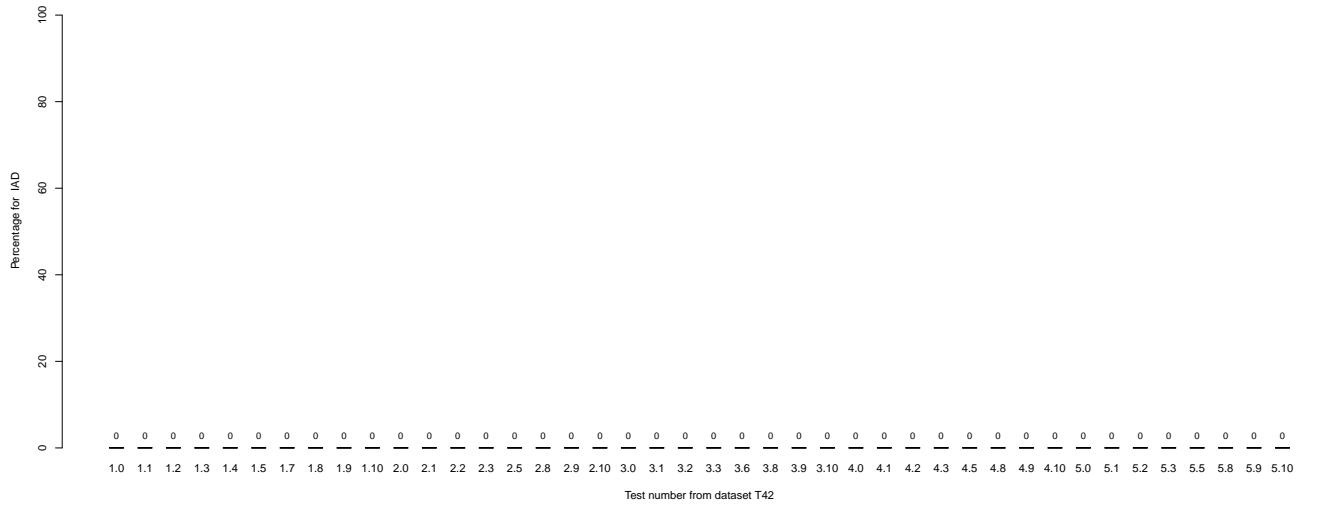


Fig. 40 Quality results for Variation/VFRBR with dataset T42 and metric IAD

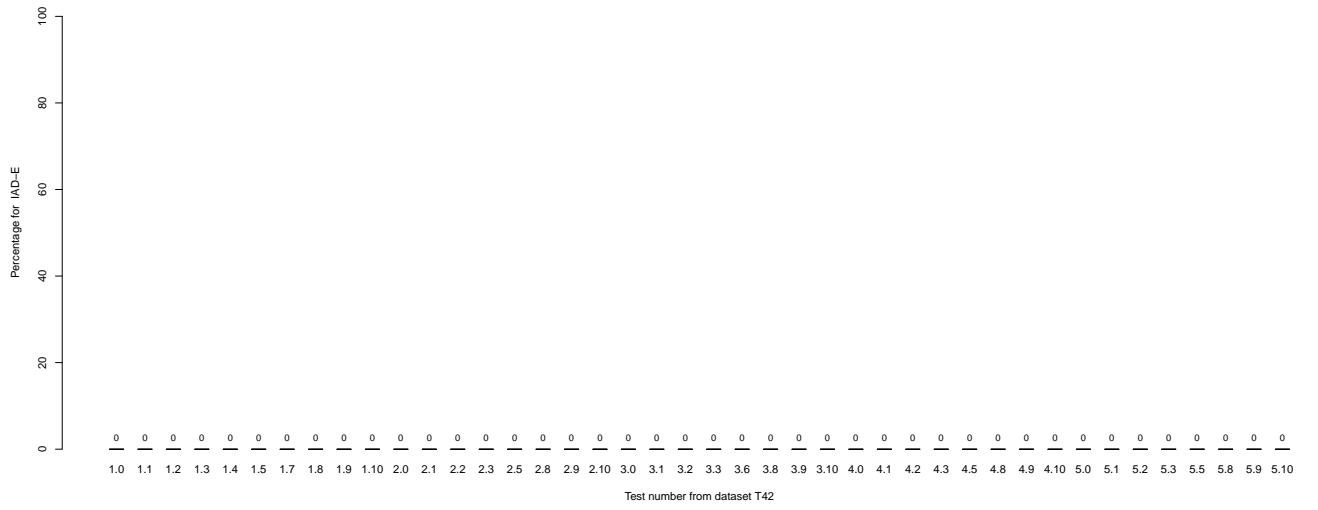


Fig. 41 Quality results for Variation/VFRBR with dataset T42 and metric IAD-E

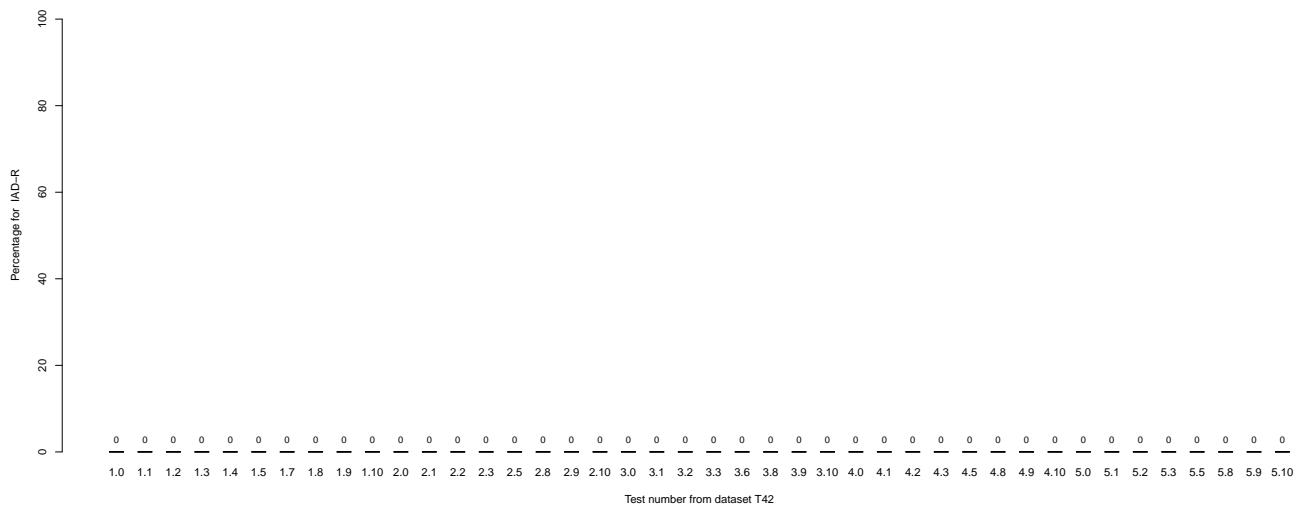


Fig. 42 Quality results for Variation/VFRBR with dataset T42 and metric IAD-R

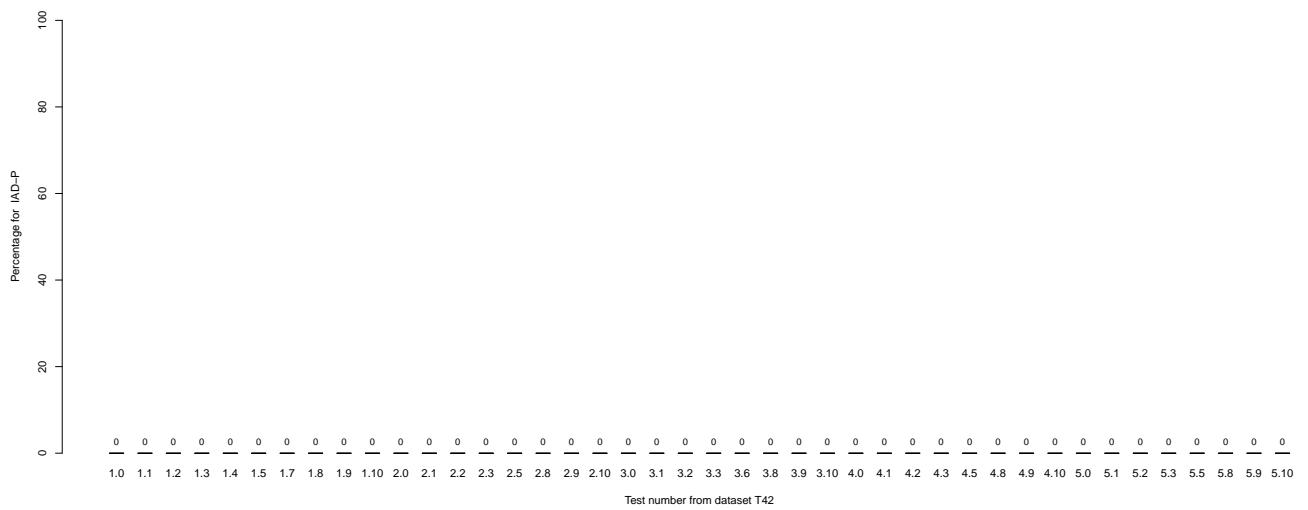


Fig. 43 Quality results for Variation/VFRBR with dataset T42 and metric IAD-P

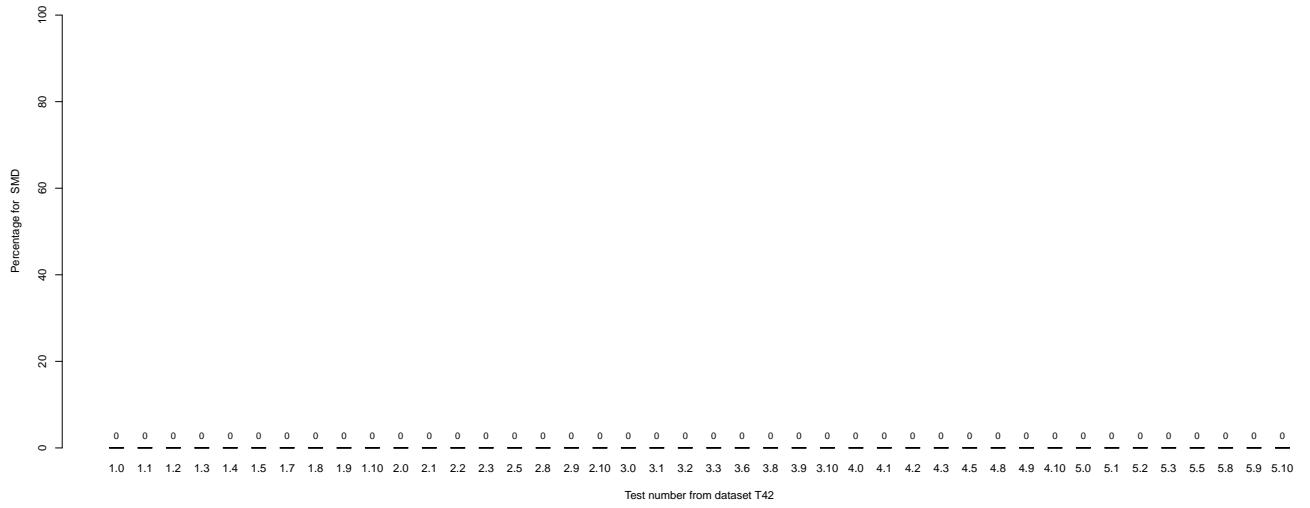


Fig. 44 Quality results for Variation/VFRBR with dataset T42 and metric SMD

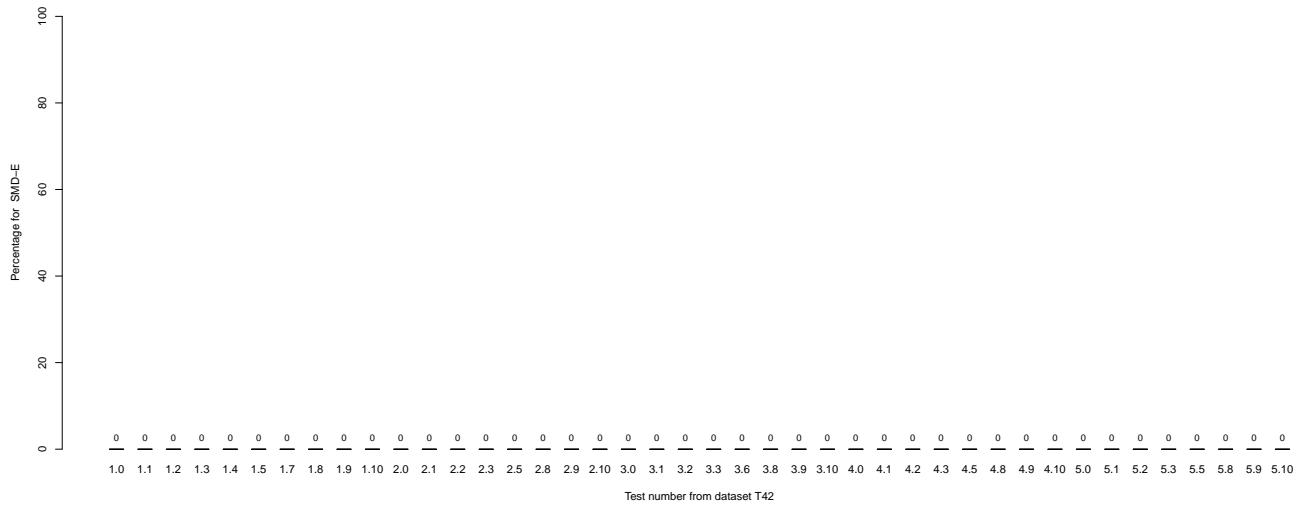


Fig. 45 Quality results for Variation/VFRBR with dataset T42 and metric SMD-E

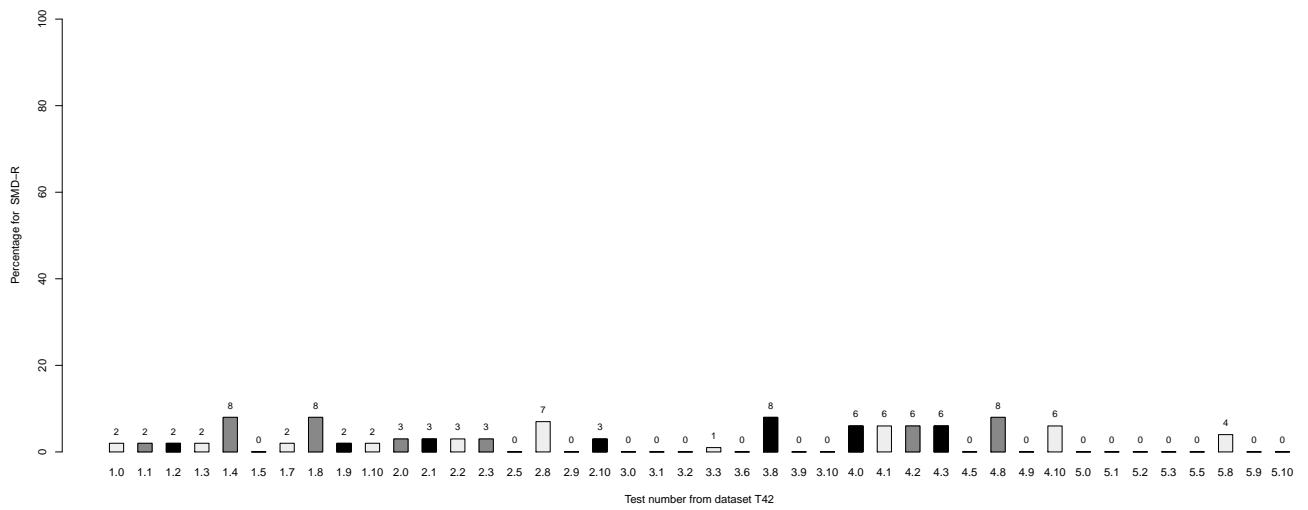


Fig. 46 Quality results for Variation/VFRBR with dataset T42 and metric SMD-R

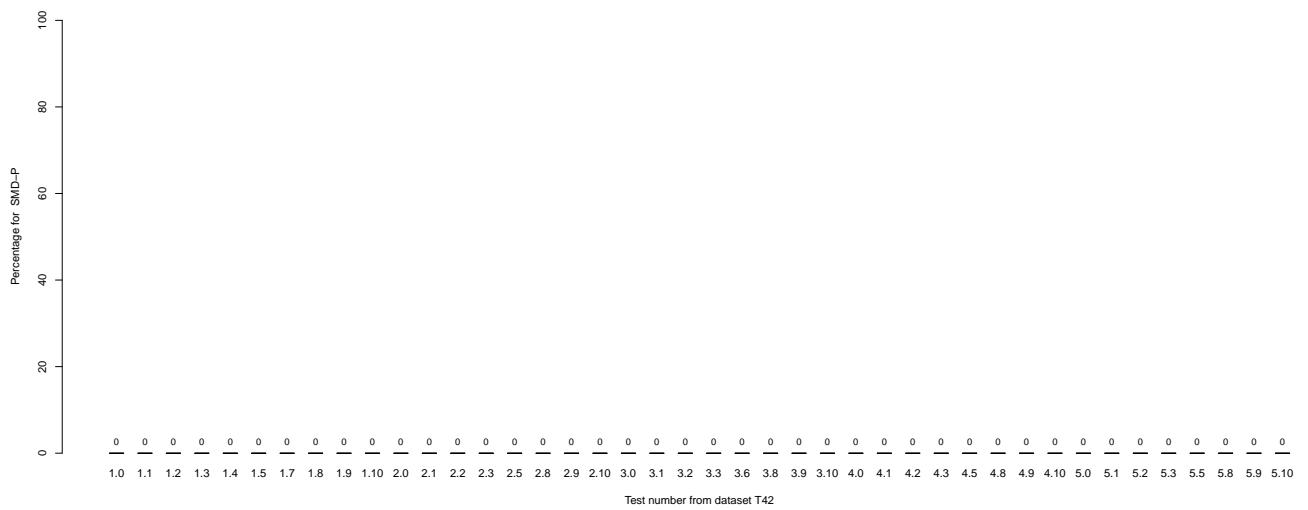


Fig. 47 Quality results for Variation/VFRBR with dataset T42 and metric SMD-P

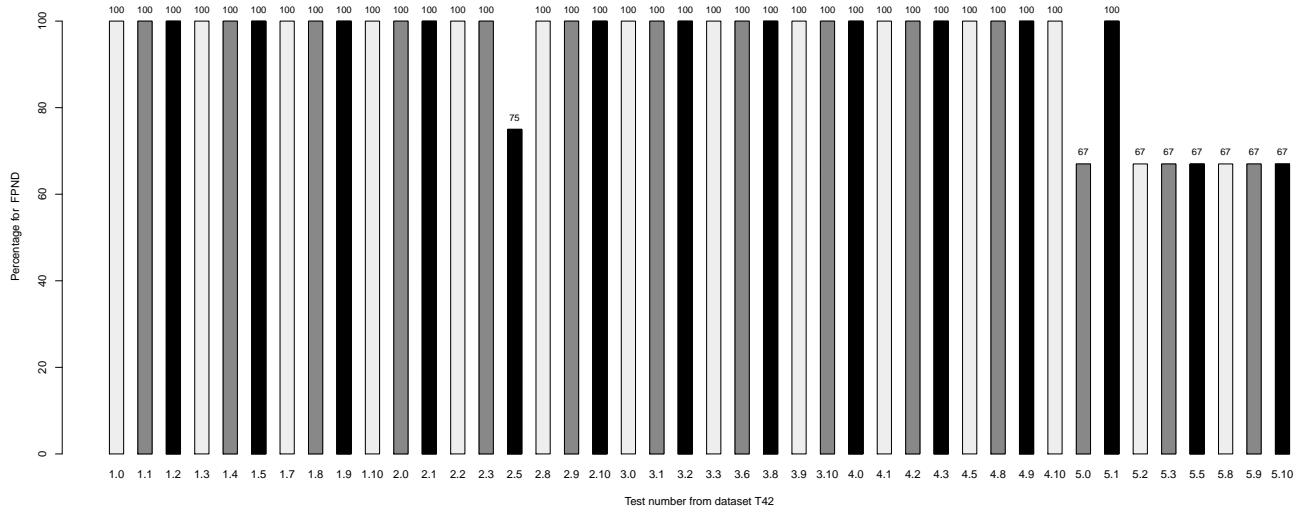


Fig. 48 Quality results for XC with dataset T42 and metric FPND

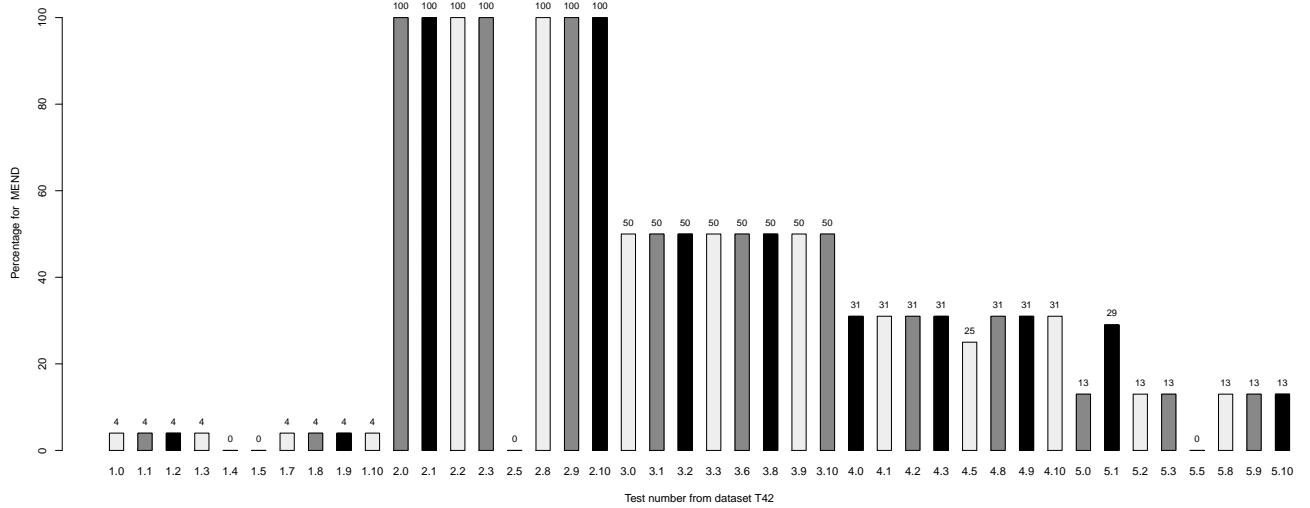
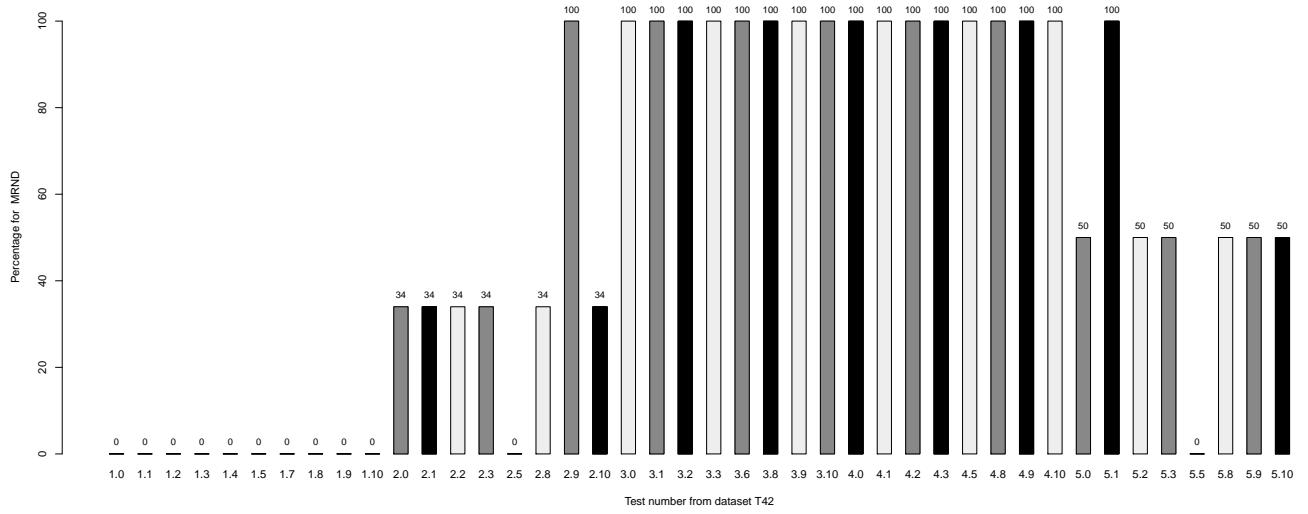
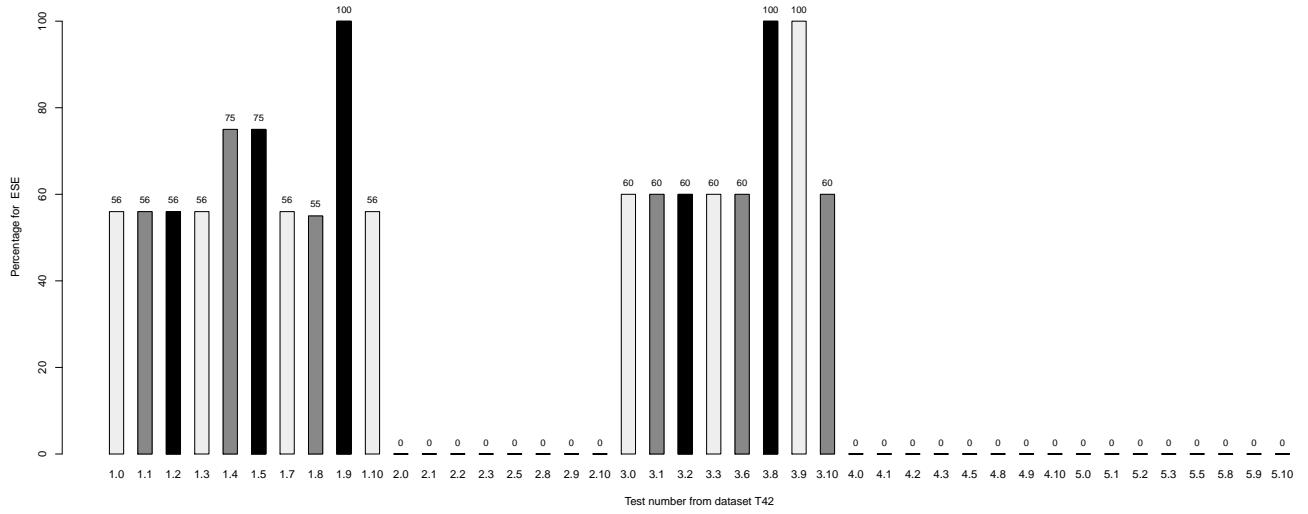


Fig. 49 Quality results for XC with dataset T42 and metric MEND

**Fig. 50** Quality results for XC with dataset T42 and metric MRND**Fig. 51** Quality results for XC with dataset T42 and metric ESE

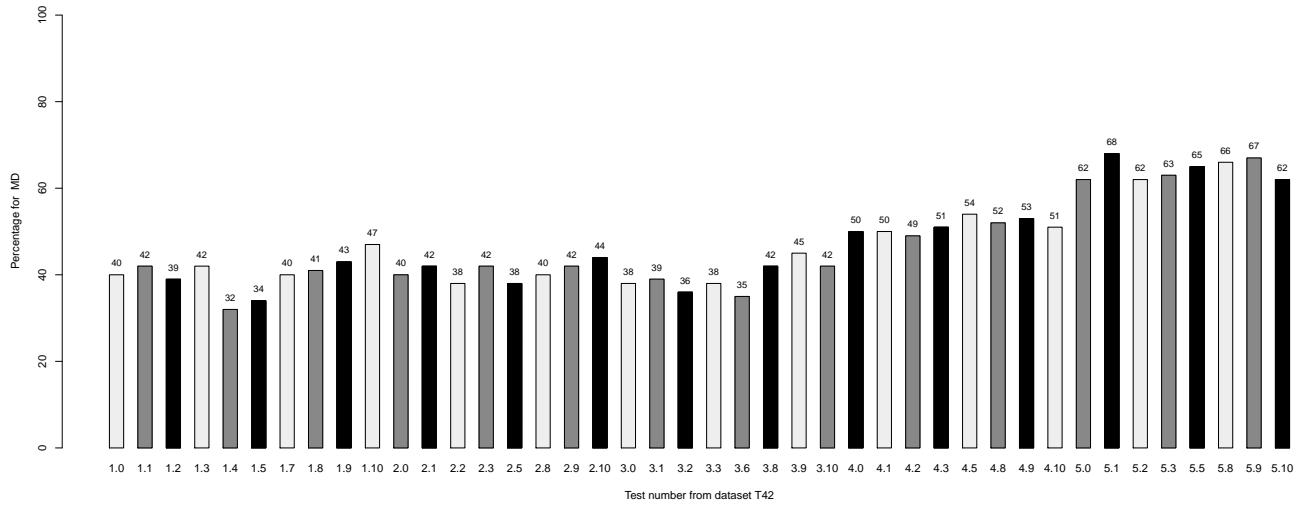


Fig. 52 Quality results for XC with dataset T42 and metric MD

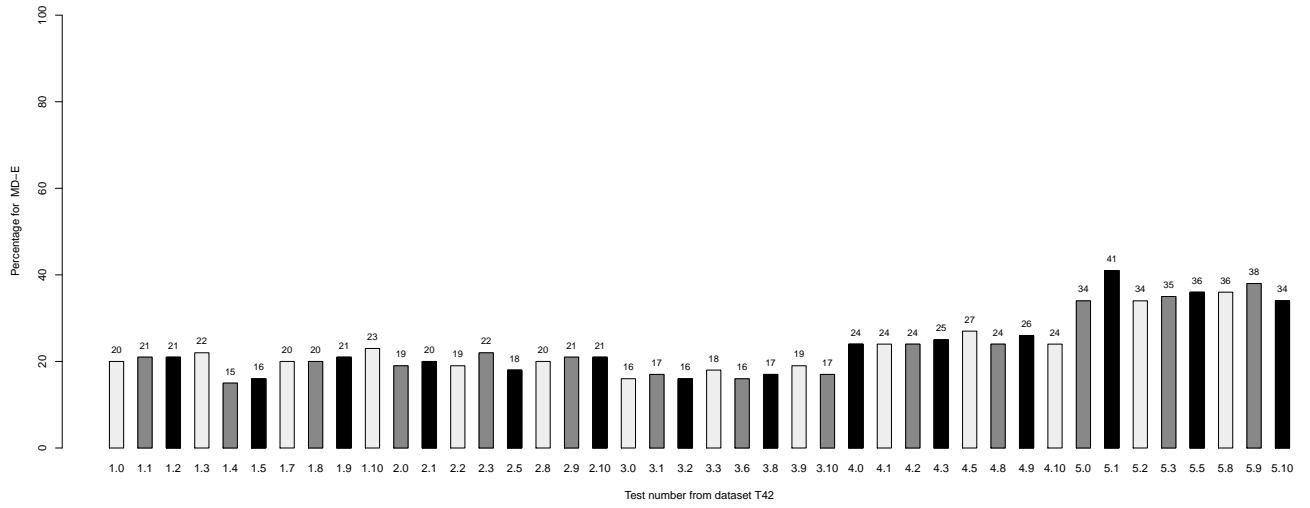
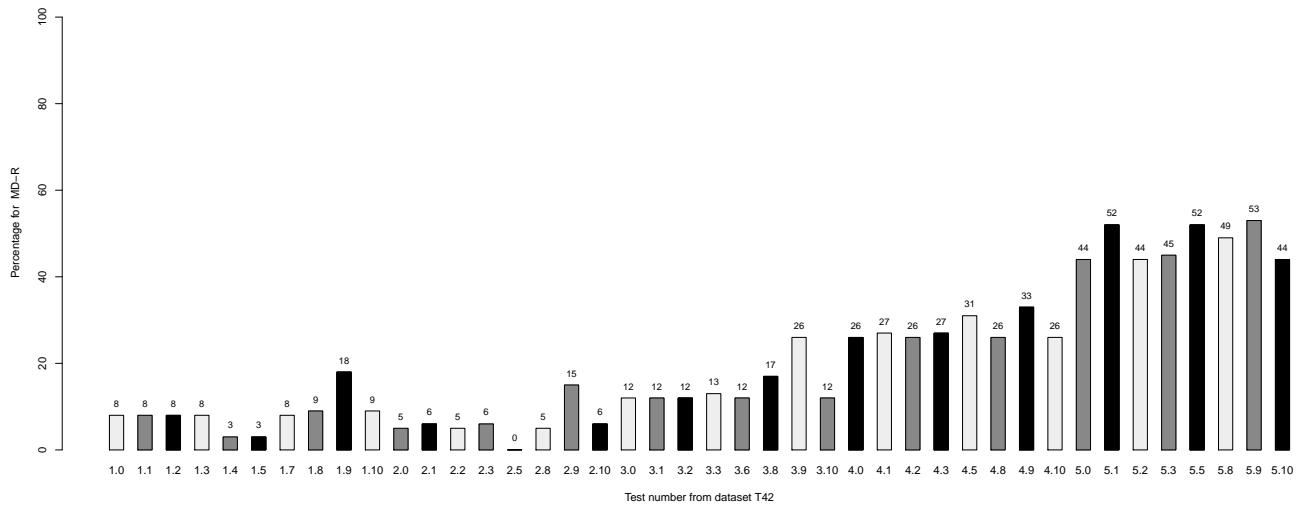
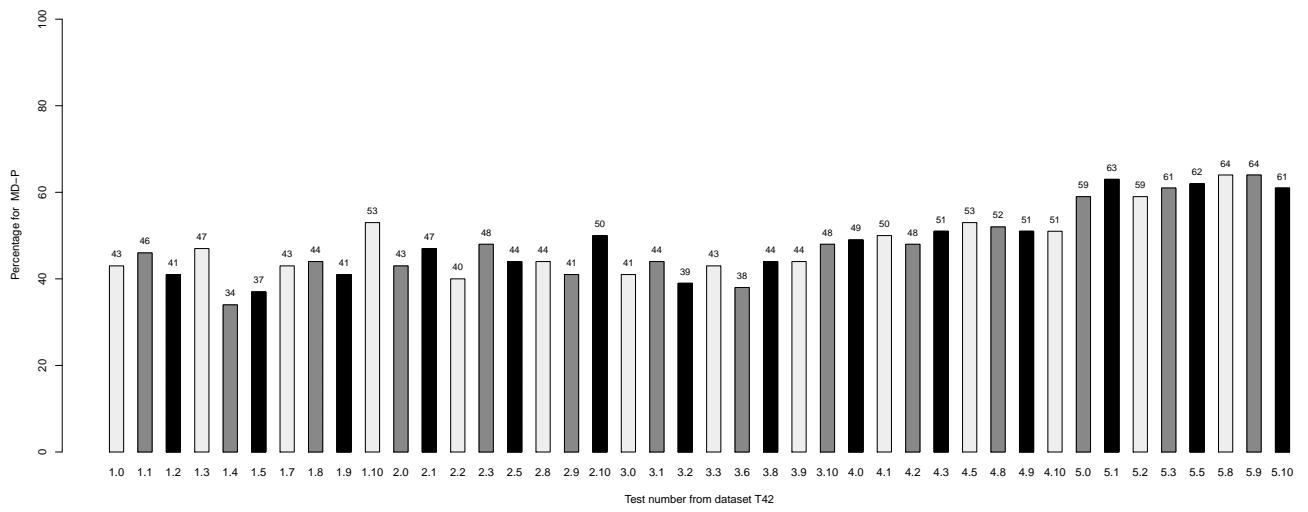


Fig. 53 Quality results for XC with dataset T42 and metric MD-E

**Fig. 54** Quality results for XC with dataset T42 and metric MD-R**Fig. 55** Quality results for XC with dataset T42 and metric MD-P

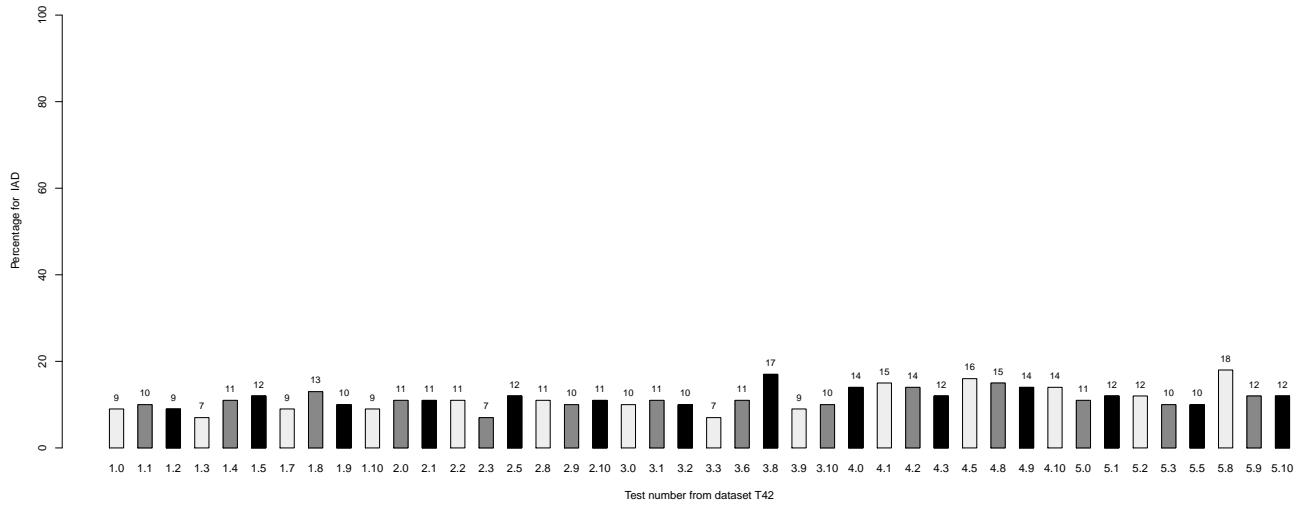


Fig. 56 Quality results for XC with dataset T42 and metric IAD

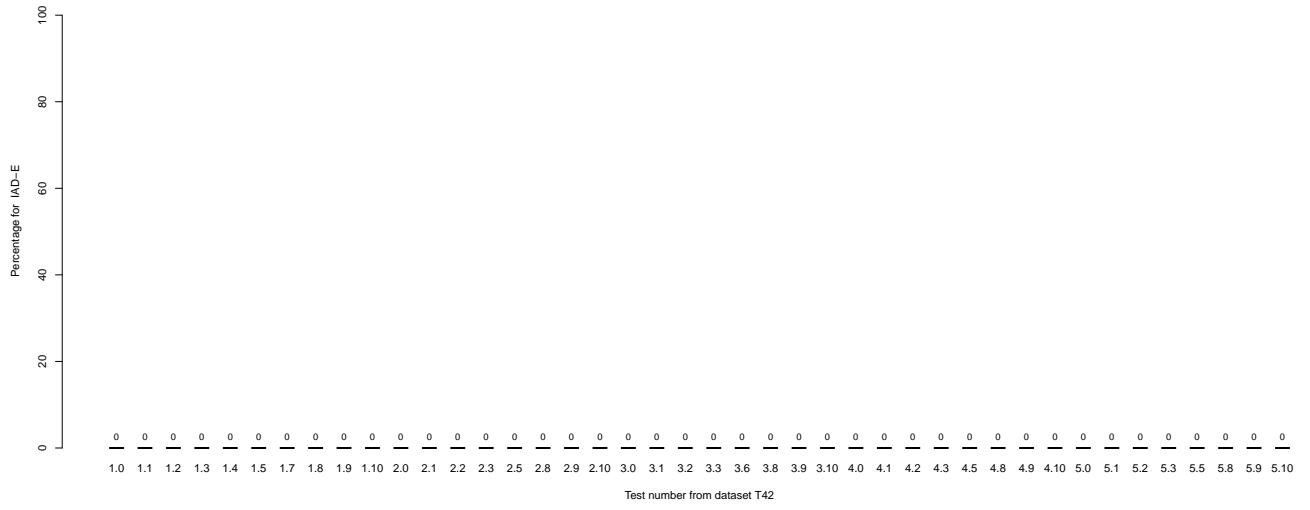
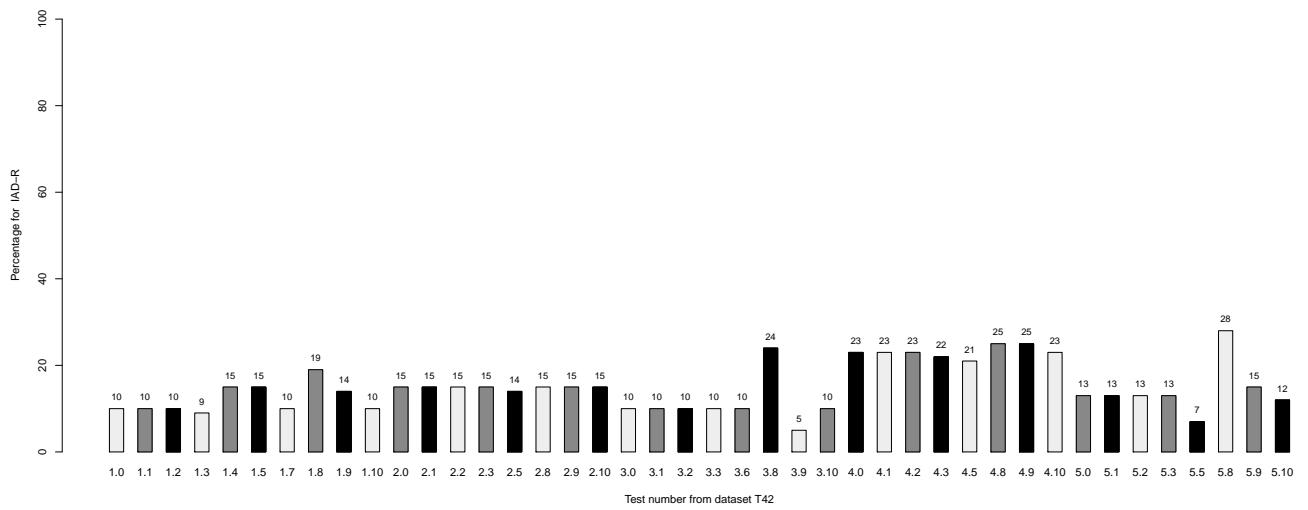
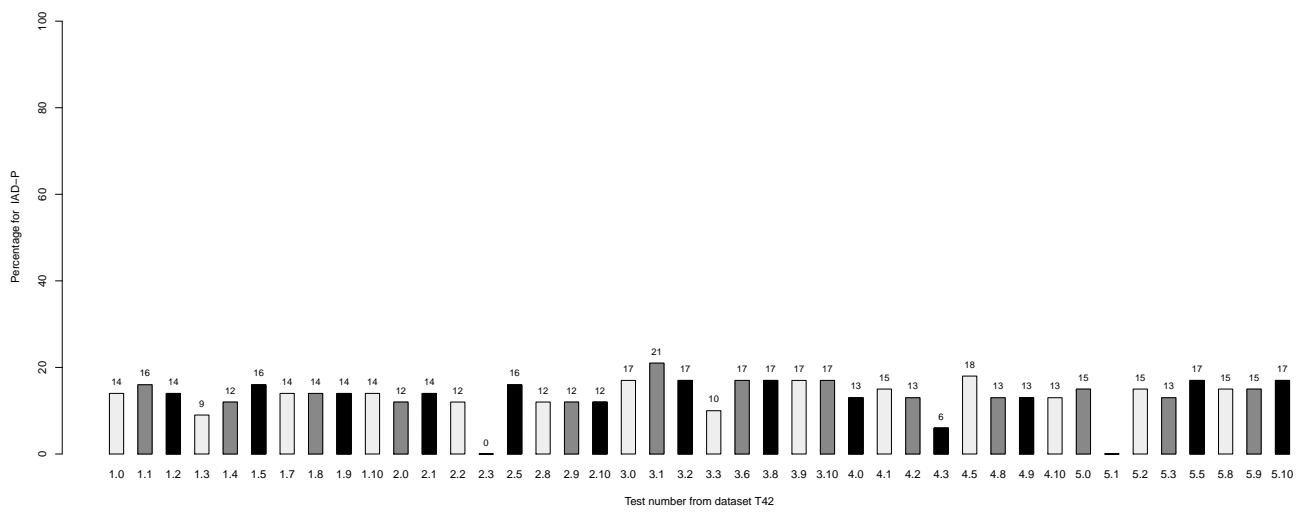


Fig. 57 Quality results for XC with dataset T42 and metric IAD-E

**Fig. 58** Quality results for XC with dataset T42 and metric IAD-R**Fig. 59** Quality results for XC with dataset T42 and metric IAD-P

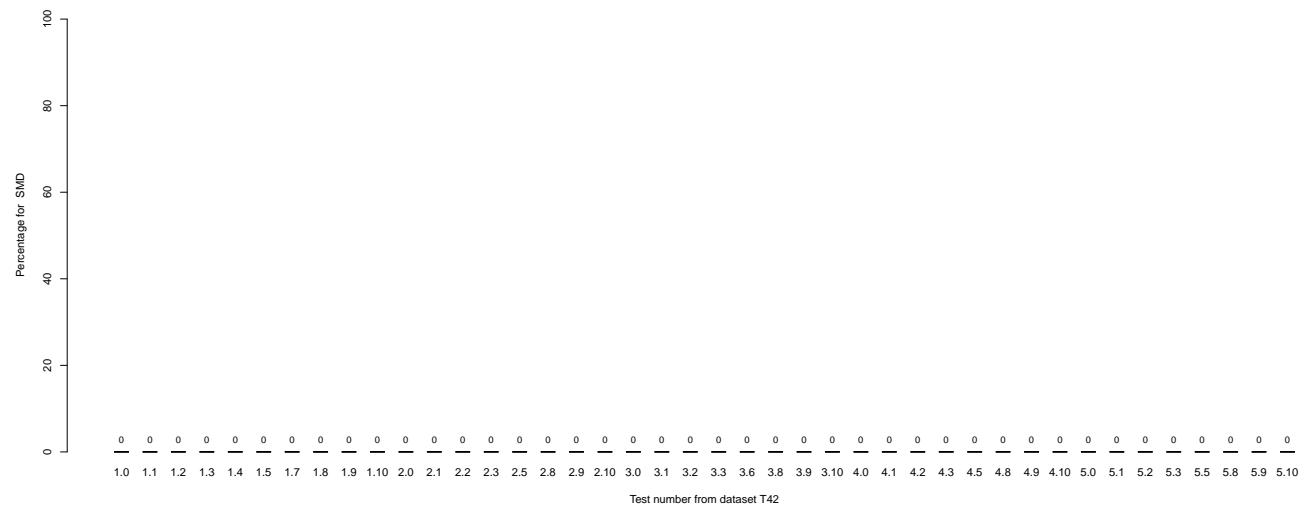


Fig. 60 Quality results for XC with dataset T42 and metric SMD

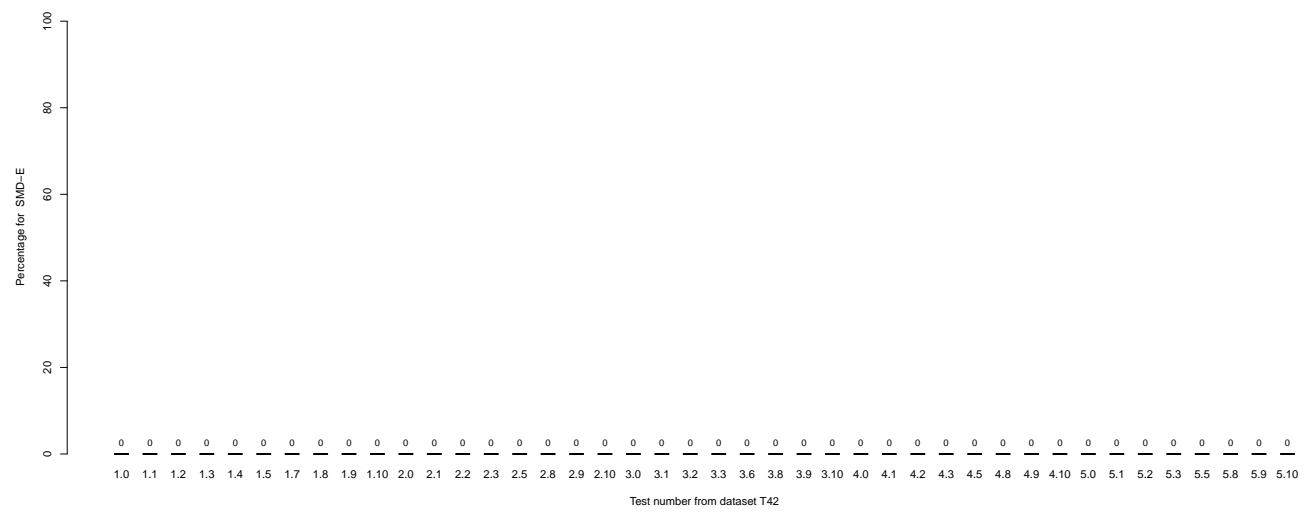


Fig. 61 Quality results for XC with dataset T42 and metric SMD-E

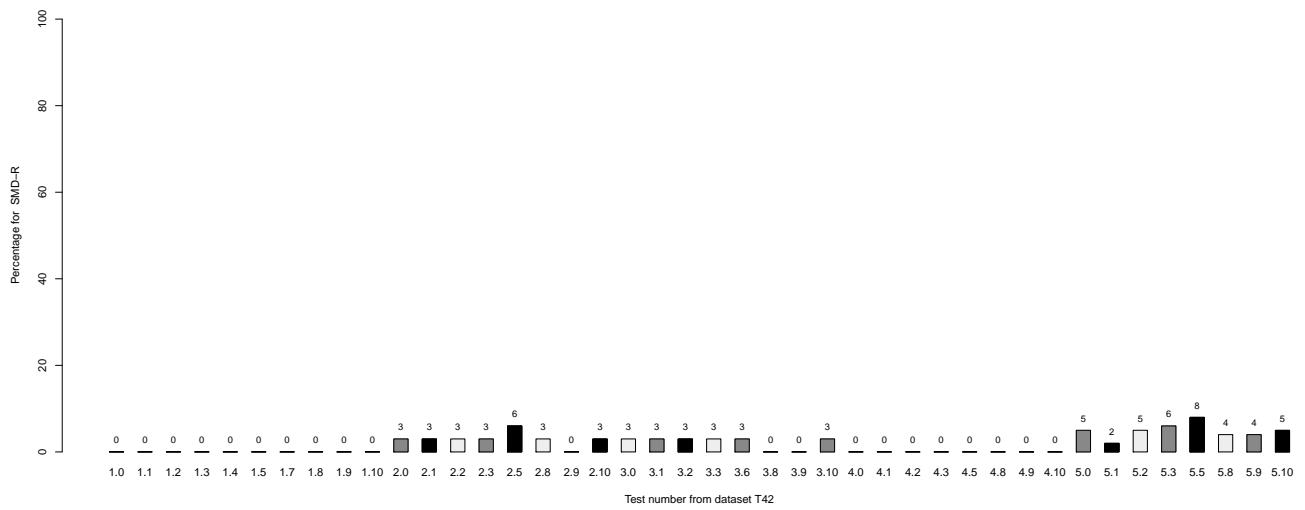


Fig. 62 Quality results for XC with dataset T42 and metric SMD-R

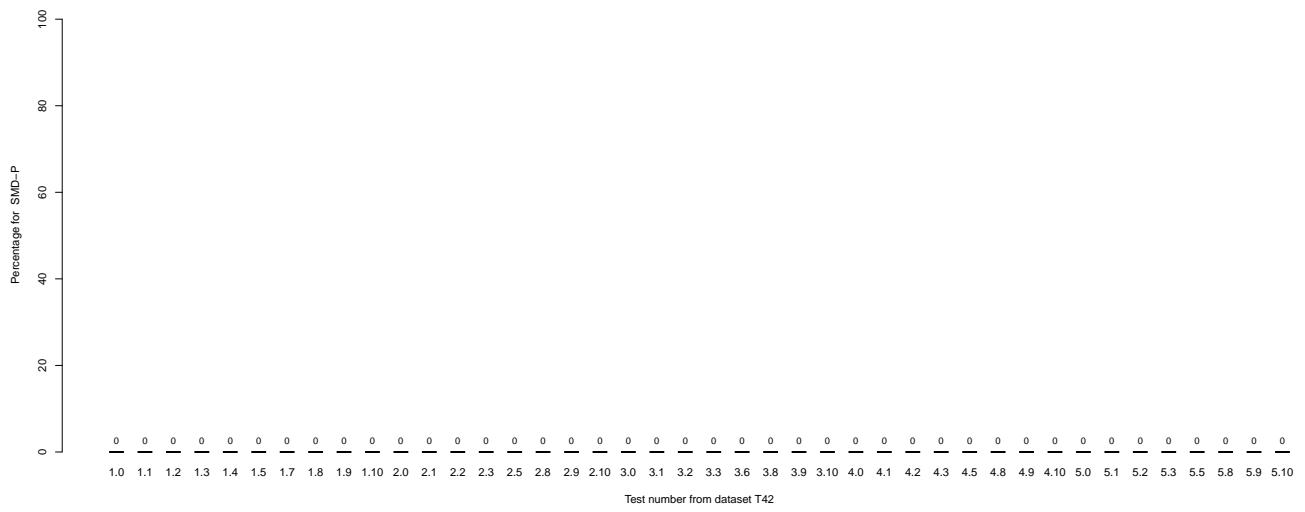


Fig. 63 Quality results for XC with dataset and metric SMD-P

3 Comparing tools in real-world context

The objective of this second experiment is to compare FRBRization tools in a real-world context using both FRBRization and post-FRBRization metrics. All tools rely on their basic set of rules (no tuning). Contrary to the dataset T42, all records from the dataset BIB-RCAT come from various institutions. This means that these real-world records can be rather simple or may contain several bibliographic patterns and issues. Note that the FRBRization metrics ETC, ETD and NRT could not be presented, because the tools did not implement these features. Instead, we provide the overall execution time for FRBRizing the dataset BIB-RCAT. The post-FRBRization metric DLE is also not given, since there exists many authority files or knowledge bases (e.g., Linked Open Data) and the expert FRBRized collection cannot include a link for each of these sources.

In the following plots, the results are organized by tool.

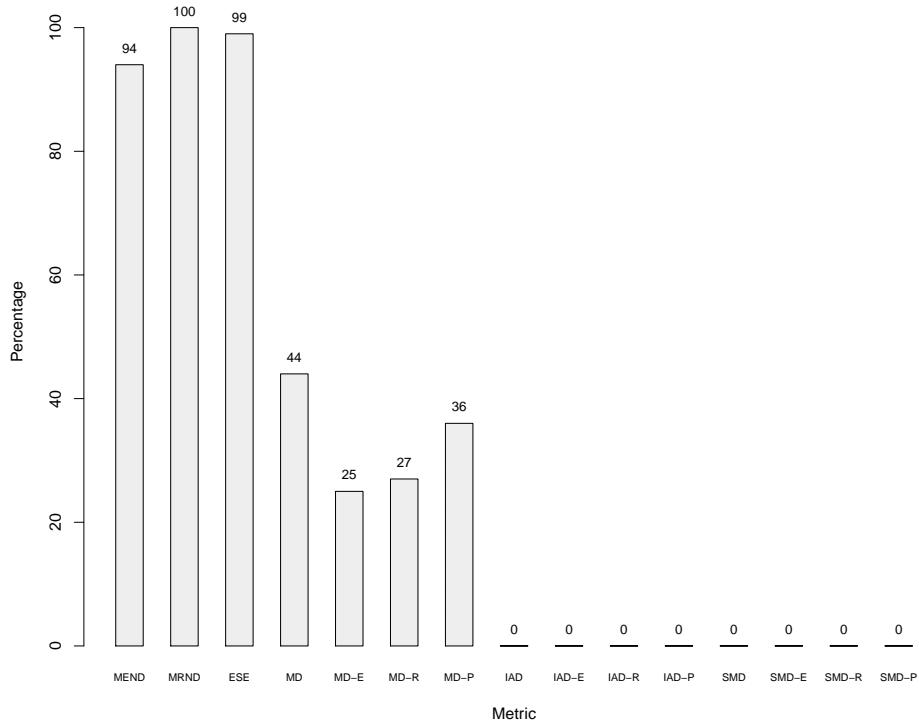


Fig. 64 Quality results for FRBR-ML basic (no tuning) on dataset BIB-RCAT

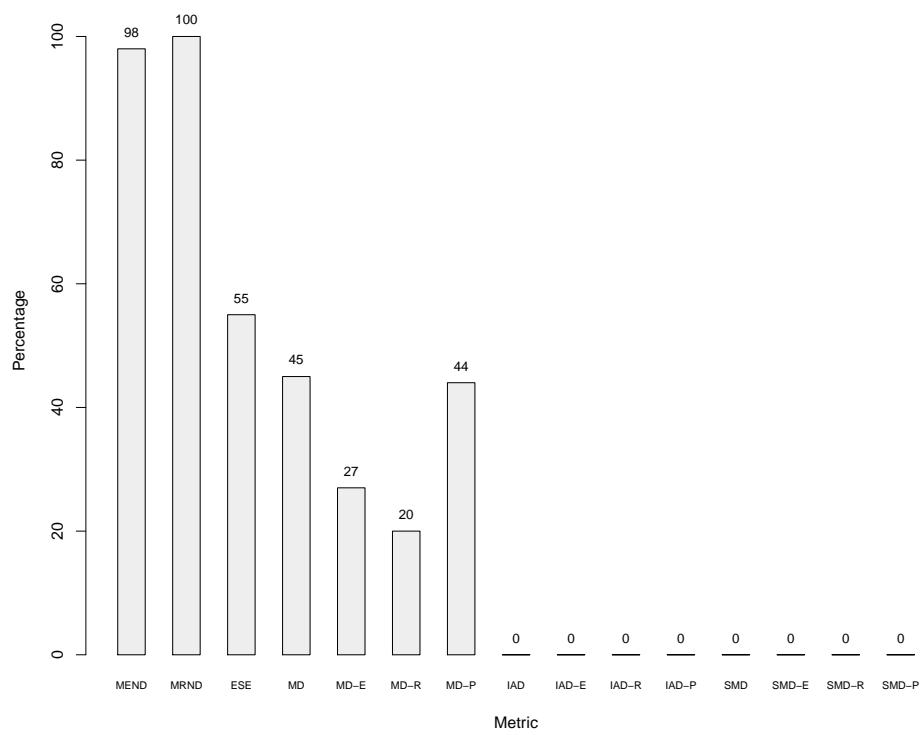


Fig. 65 Quality results for VFRBR on dataset BIB-RCAT

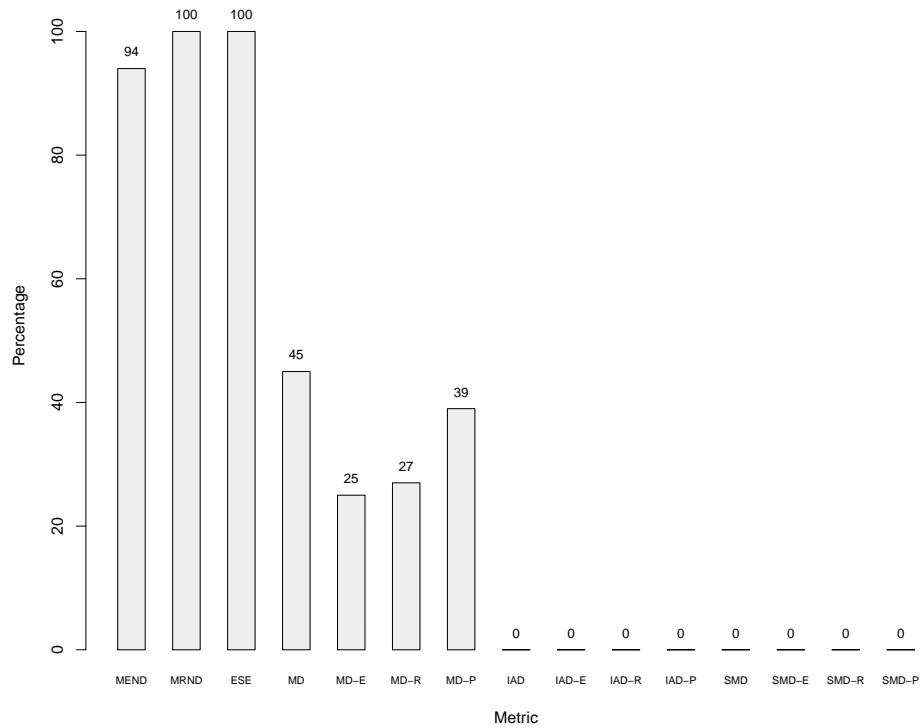


Fig. 66 Quality results for XC on dataset BIB-RCAT

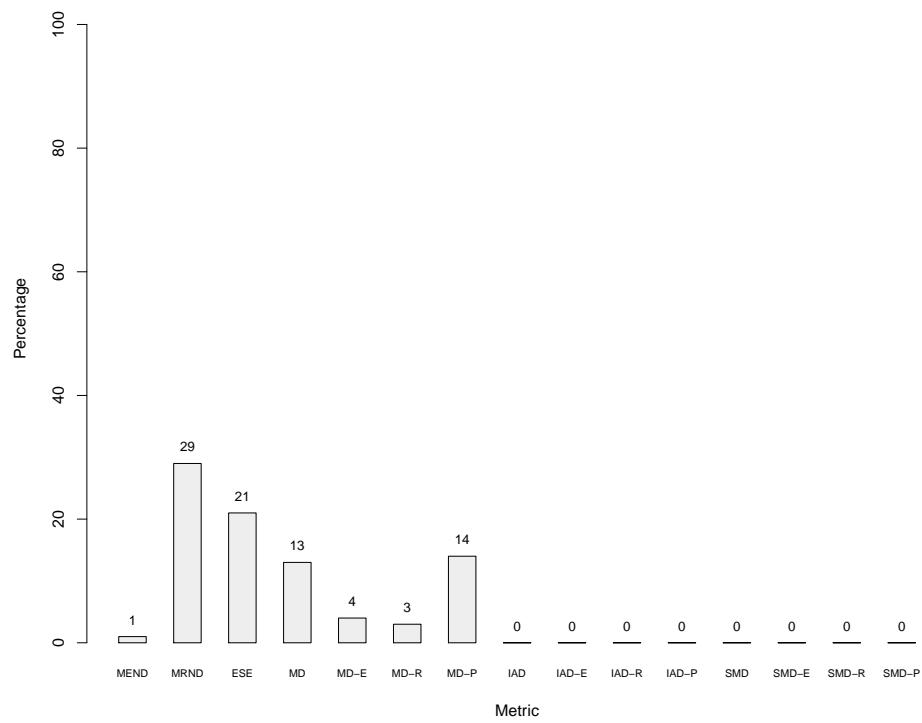
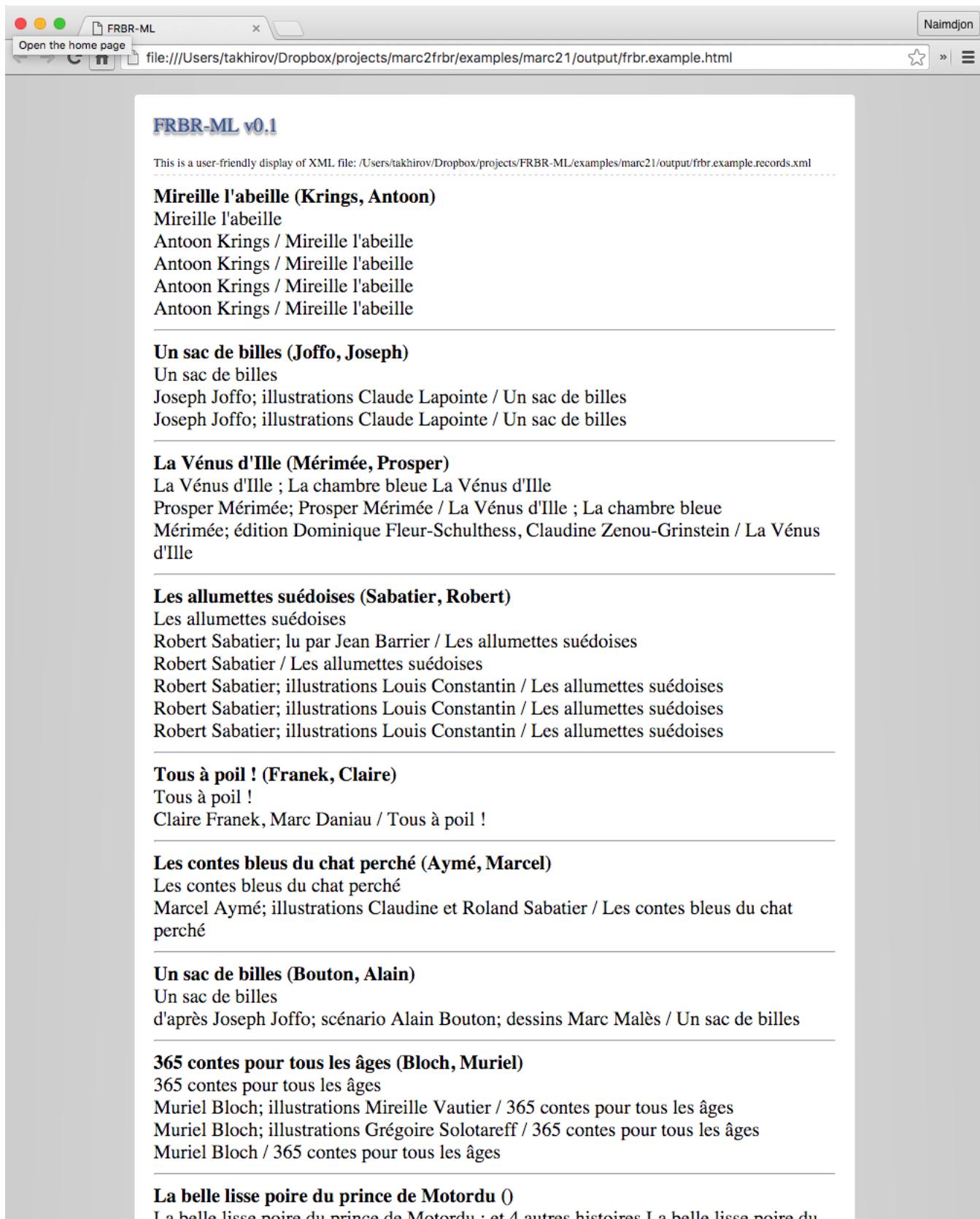


Fig. 67 Quality results for FRBR-ML tuned (enhanced set of rules) on dataset BIB-RCAT

4 Additional information about experiments

In this section, we provide screenshots of the tools that have been used during experiments.

Figure 68 depicts (an extract of) the FRBRized collection of the BIB-RCAT dataset using FRBR-ML.



FRBR-ML v0.1

This is a user-friendly display of XML file: /Users/takhirov/Dropbox/projects/FRBR-ML/examples/marc21/output/frbr.example.records.xml

Mireille l'abeille (Krings, Antoon)

Mireille l'abeille
Antoon Krings / Mireille l'abeille

Un sac de billes (Joffo, Joseph)

Un sac de billes
Joseph Joffo; illustrations Claude Lapointe / Un sac de billes
Joseph Joffo; illustrations Claude Lapointe / Un sac de billes

La Vénus d'Ille (Mérimée, Prosper)

La Vénus d'Ille ; La chambre bleue La Vénus d'Ille
Prosper Mérimée; Prosper Mérimée / La Vénus d'Ille ; La chambre bleue
Mérimée; édition Dominique Fleur-Schluthess, Claudine Zenou-Grinstein / La Vénus d'Ille

Les allumettes suédoises (Sabatier, Robert)

Les allumettes suédoises
Robert Sabatier; lu par Jean Barrier / Les allumettes suédoises
Robert Sabatier / Les allumettes suédoises
Robert Sabatier; illustrations Louis Constantin / Les allumettes suédoises
Robert Sabatier; illustrations Louis Constantin / Les allumettes suédoises
Robert Sabatier; illustrations Louis Constantin / Les allumettes suédoises

Tous à poil ! (Franek, Claire)

Tous à poil !
Claire Franek, Marc Daniau / Tous à poil !

Les contes bleus du chat perché (Aymé, Marcel)

Les contes bleus du chat perché
Marcel Aymé; illustrations Claudine et Roland Sabatier / Les contes bleus du chat perché

Un sac de billes (Bouton, Alain)

Un sac de billes
d'après Joseph Joffo; scénario Alain Bouton; dessins Marc Malès / Un sac de billes

365 contes pour tous les âges (Bloch, Muriel)

365 contes pour tous les âges
Muriel Bloch; illustrations Mireille Vautier / 365 contes pour tous les âges
Muriel Bloch; illustrations Grégoire Solotareff / 365 contes pour tous les âges
Muriel Bloch / 365 contes pour tous les âges

La belle lisse poire du prince de Motordu ()

La belle lisse noire du prince de Motordu · et 4 autres histoires La belle lisse noire du

Fig. 68 Extract of the FRBRized BIB-RCAT dataset in FRBR-ML

Figure 69 depicts (an extract of) the relationships between FRBR entities in the FRBRized collection of the BIB-RCAT dataset using FRBR-ML.

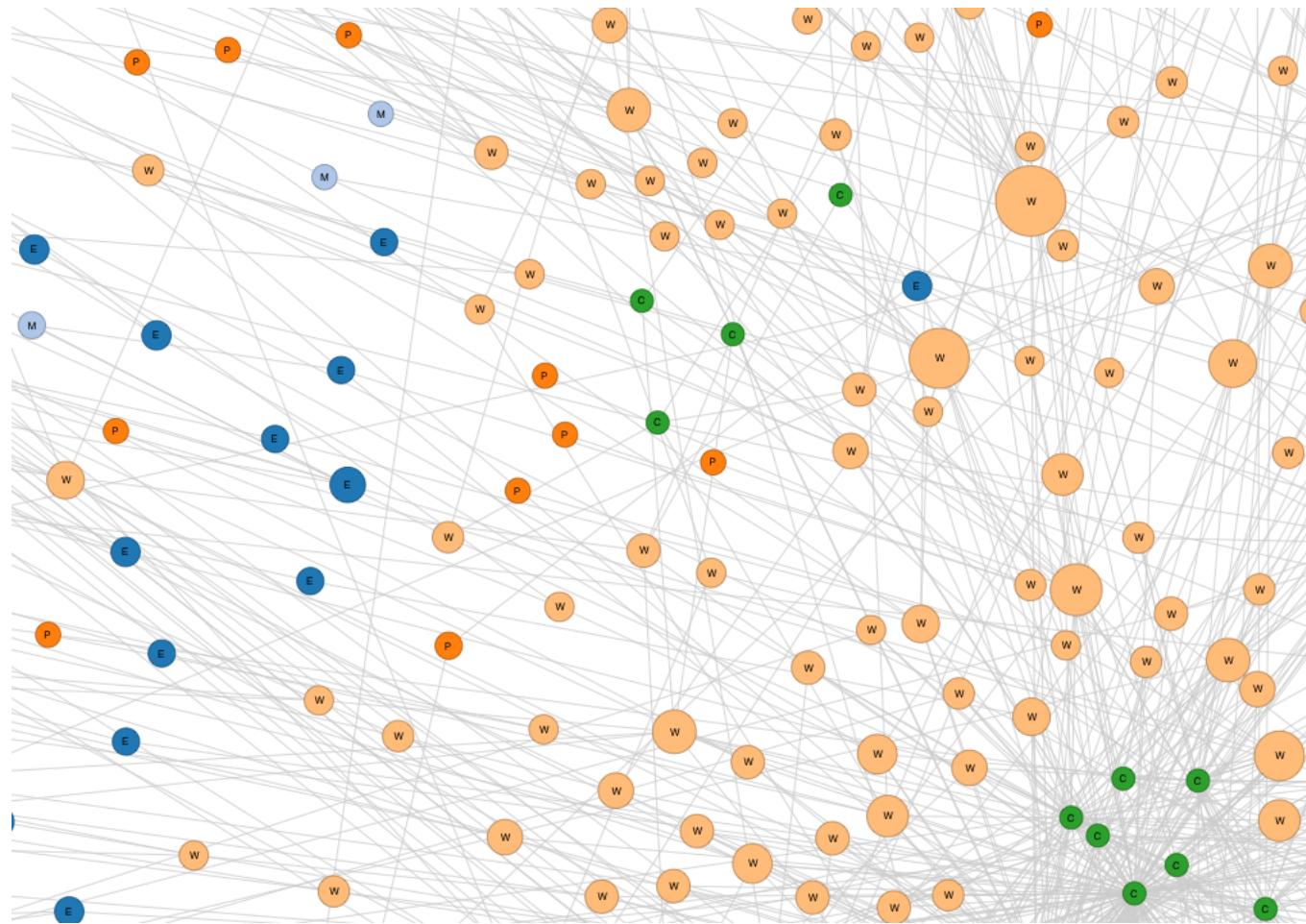


Fig. 69 Extract of a graph-based visualization of the FRBRized BIB-RCAT dataset in FRBR-ML

Figure 70 depicts (an extract of) the FRBRized collection of the BIB-RCAT dataset using Variations (Scherzo).

The screenshot shows a web-based library catalog interface for the Indiana University Scherzo system. The top navigation bar includes links for 'Basic Results', 'dijon.idi.ntnu.no:8085/scherzo/SearchResults.action?...'. The main header features the Indiana University logo and the word 'Scherzo' with a musical note icon. Below the header, a search bar displays the query 'Search: **:** as Keyword.' A 'Modify Search' link is also present.

Browse Results By:

- Creator/Composer
- Performer/Conductor or Arranger/Editor

Works: 207 results for ':** as Keyword**

1. La Fontaine, Jean de
show...
2. Brunhoff, Jean de
show...
3. Guillot, René
show...
4. Daudet, Alphonse
show...
5. Molire
show...

Recordings/Scores: 560 results for ':** as Keyword**

1. Fables, racontés par Louis de Funès; illustrations Bruno Robert. Paris Formulette production 17/06/2015. Contents: Les fables de La Fontaine People: La Fontaine, Jean de Copies: See Catalog
2. Histoire de Babar : le petit l'éléphant. Jean de Brunhoff. Vanves (Hauts-de-Seine) Hachette Jeunesse 09/06/2015. Contents: Histoire de Babar People: Brunhoff, Jean de Copies: See Catalog
3. Crin-Blanc, René Guillot; d'après le film d'Albert Lamorisse; illustrations Akos Szabo. Paris Le Livre de poche jeunesse 09/06/2015. Contents: Crin-Blanc People: Guillot, René Copies: See Catalog
4. Les lettres de mon moulin. Alphonse Daudet. Paris Librio 28/08/2013. Contents: Lettres de mon moulin People: Daudet, Alphonse Copies: See Catalog
5. Les fourberies de Scapin. Molire. Paris Librio 28/08/2013. Contents: Les fourberies de Scapin People: Molire Copies: See Catalog
6. La belle et la bête. Riquet 'la houppe. La Belle aux cheveux d'or La belle et la bête; Riquet 'la houppe; La Belle aux cheveux d'or. madame Leprince de Beaumont; édition présentée par Nicolas Saulais. Paris Nathan 23/08/2013. Contents: La Belle et la Bête People: Leprince de Beaumont, Jeanne-Marie Copies: See Catalog
7. Pièce anonyme La farce de maître Pathelin. édition présentée, annotée et commentée par Thierry Revol; traduction de Alain Miège. Paris Larousse 21/08/2013. Contents: See Catalog
8. Les allumettes suédoises. Robert Sabatier; lu par Jean Barrier. La Bazoge (Sarthe) Cdl Ed. livres audio 28/06/2013. Contents: Les allumettes suédoises People: Sabatier, Robert Copies: See Catalog
9. Yvain ou Le chevalier au lion : extraits choisis. Chrétien de Troyes; traduction en français moderne et appareil pédagogique établis par Hélène Dardelin; lexique fabriqué par Michèle Sendre. Paris Magnard 21/06/2013. Contents: Yvain ou Le chevalier au lion People: Chrétien de Troyes; Dardelin, Hélène

Fig. 70 Extract of the FRBRized BIB-RCAT dataset in Scherzo (Variations/VFRBR)

Below we present the interpretation of a MARC record in FRBR using XC. Figure 71 depicts the initial MARC record. Figures 72, 73 and 74 respectively illustrate the FRBRization into a Work, an Expression and a Manifestation.

Status: Active
 Repository: MTOAI
 Repository URL: <http://localhost:8080/OAIToolkit/oai-request.do>
 Schema: marc21
 Sets: MTOAI:Bibliographic records , MTOAI
 Created at: 2016-01-08 09:58:29.0
 Updated at: 2016-01-08 10:02:03.0
 OAI datetstamp:
 OAI identifier: oai:syris.research:datasetT42/11

3 Successors

```
<marc:record xmlns:marc="http://www.loc.gov/MARC21/slim" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.loc.gov/MARC21/slim http://localhost:8080/OAIToolkit/schema/MARC21slim.xsd">
  <marc:leader>01208cam a2200277 i 4500</marc:leader>
  <marc:controlfield tag="001">2200008</marc:controlfield>
  <marc:controlfield tag="005">20030518101543.0</marc:controlfield>
  <marc:controlfield tag="008">08073061976 docu f0000 eng d</marc:controlfield>
  <marc:datafield ind1=" " ind2=" " tag="020">
    <marc:subfield code="a">9782081209633</marc:subfield>
    <marc:subfield code="c">2,70 euro</marc:subfield>
  </marc:datafield>
  <marc:datafield ind1="1" ind2=" " tag="041">
    <marc:subfield code="a">French</marc:subfield>
  </marc:datafield>
  <marc:datafield ind1="1" ind2=" " tag="100">
    <marc:subfield code="a">Keime, Christian</marc:subfield>
    <marc:subfield code="4">drt</marc:subfield>
  </marc:datafield>
  <marc:datafield ind1="1" ind2="0" tag="240">
    <marc:subfield code="a">Roman de Renart</marc:subfield>
  </marc:datafield>
  <marc:datafield ind1="1" ind2="0" tag="245">
    <marc:subfield code="a">Roman de Renart (Le)</marc:subfield>
    <marc:subfield code="c">Christian Keime; Monique Lachet-Lagarde</marc:subfield>
    <marc:subfield code="h">[publication]</marc:subfield>
  </marc:datafield>
  <marc:datafield ind1="3" ind2=" " tag="260">
    <marc:subfield code="a">Paris</marc:subfield>
    <marc:subfield code="b">Flammarion</marc:subfield>
    <marc:subfield code="c">18 cm</marc:subfield>
  </marc:datafield>
  <marc:datafield ind1=" " ind2=" " tag="300">
    <marc:subfield code="a">159 pages</marc:subfield>
    <marc:subfield code="b">Illustrations, cover with colorful illustrations</marc:subfield>
    <marc:subfield code="c">18 cm</marc:subfield>
  </marc:datafield>
  <marc:datafield ind1="0" ind2=" " tag="490">
    <marc:subfield code="a">Etonnantes classiques. 335</marc:subfield>
  </marc:datafield>
  <marc:datafield ind1="1" ind2=" " tag="700">
    <marc:subfield code="a">Lachet-Lagarde, Monique</marc:subfield>
    <marc:subfield code="4">adp</marc:subfield>
  </marc:datafield>
  <marc:datafield ind1="1" ind2=" " tag="760">
    <marc:subfield code="w">colauth-007</marc:subfield>
    <marc:subfield code="t">Etonnantes classiques</marc:subfield>
  </marc:datafield>
</marc:record>
```

MetadataServicesToolkit v1.5.5 - svn.version:

Fig. 71 A MARC record displayed in XC web interface

The screenshot shows a web browser window titled "Browse Records - Iceweasel" with multiple tabs open, all showing the same record. The main content area displays the following information:

XC Metadata Services Toolkit

Status: Active
Service: marctoxctransformation
Schema: xc
Sets:
Created at: 2016-01-08 10:03:24.0
Updated at: 2016-01-08 10:03:27.0
OAI timestamp:
OAI identifier: oai:syrtis.research:MetadataServicesToolkit/marctoxctransformation/52

1 Predecessor

```
<xc:frbr xmlns:xc="http://www.extensiblecatalog.info/Elements" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:rdrrole="http://rdvocab.info/roles" xmlns:rvocab="http://rdvocab.info/Elements" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <xc:entity id="oai:syrtis.research:MetadataServicesToolkit/marctoxctransformation/52" type="work">
    <rdvocab:titleOfWork>Roman de Renart</rdvocab:titleOfWork>
  </xc:entity>
</xc:frbr>
```

MetadataServicesToolkit v 1.5.5 - svn.version:

Fig. 72 A FRBR Work entity displayed in XC web interface

The screenshot shows a web browser window titled "Browse Records - Iceweasel" with multiple tabs open, all showing the same record. The main content area displays the following information:

XC Metadata Services Toolkit

Status: Active
Service: marctoxctransformation
Schema: xc
Sets:
Created at: 2016-01-08 10:03:24.0
Updated at: 2016-01-08 10:03:27.0
OAI timestamp:
OAI identifier: oai:syrtis.research:MetadataServicesToolkit/marctoxctransformation/53

1 Predecessor

```
<xc:frbr xmlns:xc="http://www.extensiblecatalog.info/Elements" xmlns:dcterms="http://purl.org/dc/terms/" xmlns:rdrrole="http://rdvocab.info/roles" xmlns:rvocab="http://rdvocab.info/Elements" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <xc:entity id="oai:syrtis.research:MetadataServicesToolkit/marctoxctransformation/53" type="expression">
    <rdvocab:director>Keime, Christian</rdvocab:director>
    <xc:titleOfExpression>Roman de Renart</xc:titleOfExpression>
    <rdvocab:illustrationContent>Illustrations, cover with colorful illustrations</rdvocab:illustrationContent>
    <xc:contributor>Lachet-Lagarde, Monique</xc:contributor>
    <xc:workExpressed>oai:syrtis.research:MetadataServicesToolkit/marctoxctransformation/52</xc:workExpressed>
  </xc:entity>
</xc:frbr>
```

MetadataServicesToolkit v 1.5.5 - svn.version:

Fig. 73 A FRBR Expression entity displayed in XC web interface

The screenshot shows a web browser window titled "Browse Records - Iceweasel" with the URL "localhost:8080/MetadataServicesToolkit/st/viewRecord.action?recordId=51&query=&selectedFacetNames=[processed_from&selx].<input type='text' value='Search' style='width: 150px; height: 15px; border: 1px solid black; margin-right: 5px;'>"

The main interface is titled "Metadata Services Toolkit" and shows a navigation bar with links: Repository, Harvest, Services, Processing Rules, Browse Records, Logs, Users/Groups, Configuration.

The current page is "Browse Records > Search Results > View Record oai:syrtis.research:MetadataServicesToolkit/marctoxctransformation/51".

Details for the record are listed:

- Status: Active
- Service: marctoxctransformation
- Schema: xc
- Sets:
- Created at: 2016-01-08 10:03:24.0
- Updated at: 2016-01-08 10:03:27.0
- OAIDatestamp:
- OAIDentifier: oai:syrtis.research:MetadataServicesToolkit/marctoxctransformation/51
- 1 Predecessor

The main content area displays the XML representation of the FRBR Manifestation entity:

```

<xc:frbr xmlns:xc="http://www.extensiblecatalog.info/Elements" xmlns:dcterms="http://purl.org/dc/terms/"
  xmlns:rdvocab="http://rdvocab.info/Elements"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <xc:entity id="oai:syrtis.research:MetadataServicesToolkit/marctoxctransformation/51" type="manifestation">
    <rdvocab:statementOfResponsibilityRelatingToTitle>Christian Keime; Monique Lachet-
    Lagarde</rdvocab:statementOfResponsibilityRelatingToTitle>
    <dcterms:title>Roman de Renart (Le)</dcterms:title>
    <rdvocab:placeOfProduction>Paris</rdvocab:placeOfProduction>
    <dcterms:publisher>Flammarion</dcterms:publisher>
    <dcterms:issued>2008</dcterms:issued>
    <dcterms:extent>159 pages</dcterms:extent>
    <rdvocab:dimensions>18 cm</rdvocab:dimensions>
    <dcterms:isPartOf>Etonnantes classiques . 335</dcterms:isPartOf>
    <dcterms:isPartOf>Etonnantes classiques</dcterms:isPartOf>
    <xc:expressionManifested>oai:syrtis.research:MetadataServicesToolkit/marctoxctransformation
    /53</xc:expressionManifested>
  </xc:entity>
</xc:frbr>

```

At the bottom right of the interface, it says "MetadataServicesToolkit v 1.5.5 - svn.version:155".

Fig. 74 A FRBR Manifestation entity displayed in XC web interface

5 Acknowledgments

This work has been partially supported by the French Agency ANRT (www.anrt.asso.fr), the company PROGILONE (www.progilone.com/), a PHC Aurora funding (#34047VH) and a CNRS PICS funding (#PICS06945).

References

1. Decourselle, J., Duchateau, F., Aalberg, T., Takhirov, N., Lumineau, N.: BIB-R: a Benchmark for the Interpretation of Bibliographic Records. In: Theory and Practice of Digital Libraries (TPDL). Hannover, Germany (2016). URL <https://hal.archives-ouvertes.fr/hal-01324529>