

Informal Affixation on Twitter Tweets as Teaching Material for News Texts in High School

Puput Noviana Indra Mulyani, Markhamah^(⊠), Atiqa Sabardila, and Agus Budi Wahyudi

Indonesian Language and Literature Education, Faculty of Teaching and Education,
Universitas Muhammadiyah Surakarta, Surakarta, Indonesia
mar 274@ums.ac.id

Abstract. This research aims to describe the forms of informal affixation on Twitter tweets and their implementation as teaching materials for high school news texts. This research is a qualitative descriptive study. Research data were words that contained informal affixes on Twitter tweets. Data collection utilized observation and documentation techniques. Data analysis used referential and translational identity methods. This study found two types of informal affixation: verb-forming (suffix -an, -in, prefix ke-, combination di-in) and adjective-forming (affix -an, combination ke-an). The results of this study can be implemented as teaching material for news texts in high schools with Learning Outcomes (CP): students are able to express ideas and thoughts in simple news texts.

Keywords: informal affixation \cdot tweet \cdot news text teaching material

1 Introduction

Tweeting and posting on social media Twitter is unique in its use of Indonesian. Tweets (status updates) are venues where Twitter users can express themselves in 140 characters or less [1]. Judging from users' tweets, twitter is able to describe the current condition. In sharing tweets, there needs to be a means or media that is easily accessible to other people so that they can be known and read, one of which is through social media Twitter. Twitter is a form of social media in the form of text uploads containing the opinions or thoughts of its users [2]. Twitter is also often used as a place to complain without revealing the user's identity.

Along with the development of various social media, with the majority of Indonesian society being plural, phenomena related to language are often found in everyday life [3]. Words in tweets sometimes attract readers' attention both in terms of the language utilized, as well as the meaning contained therein. This is often due to the process of forming words or what is known as morphology. Morphology is a branch of science that studies the formation or form of words [4]. In other words, morphology is a field of linguistics that examines between one morpheme and another to form a word. [5]. The

formation of a word involves the elements or the word itself in the form of morphemes, formation of affixes, and basic morphemes with various means.

In morphology there are 3 processes of forming a word, namely affixation, composition, and reduplication. Affix is a form of bound morpheme that is added to a basic word in the process of word formation [6]. Affixation can be interpreted as a grammatical unit that is added to a word that is at the beginning, middle, or end, even combined to form a new meaning. [7]. The affixation process in an affix is added to the basic form so that the end result is a word entity [8]. This study examines informal affixation, which is a word that undergoes a process of affixation in the form of prefixes, infixes, and suffixes that form words, both as non-standard and informal words. Meanwhile, the position of affixes in the basic form in the affixation process is in the form of prefix, suffix, affixes, infixes, confixes [9].

Studies about afixation were previously performed by [8, 10–22]. In those studies, similarities were found in the form of examining the process of affixation in general. Meanwhile, the difference is that the research objects studied in previous studies were diverse, while the object of this research examines informal affixations and their implementation as teaching materials in learning.

The increasing use of informal affixes on Twitter encourages researchers to focus more on research on informal affixes found in tweets on Twitter social media. The researcher is interested in making the research results an alternative to Indonesian language teaching materials in senior high schools (SMA). Learning is defined as interaction activities between educators, students, and learning resources [23]. Learning resources are not only in the form of books, but can be in other forms that are varied and innovative [24]. One of the teaching materials can come from research results.

Teaching materials are all information, texts, and tools needed by educators to support or assist teachers in carrying out teaching and learning activities in class [25]. Meanwhile, teaching materials can be interpreted as learning tools or media that contain the subject matter of learning [26]. Thus, it is logical to state that the results of this study can be used as Indonesian language teaching materials in high schools (SMA) related to the affixation process.

2 Method

This study is a qualitative descriptive research. Qualitative descriptive research is research that is expressed in sentence exposure [27]. This study aims to describe informal affixation forms on Twitter tweets which were then used as Indonesian language teaching materials in high school. Data collection was carried out for 2 months, from August to September 2022 and data analysis was from October to December 2022. The subject of this research is tweets on Twitter. Documentation and observation techniques were utilized in the data collection. The first step was to find and document tweets that contain informal affixations. Data analysis utilized referential and translational identity methods. Referential identity method was used to analyze the meaning of affixes. Translational identity method was used to indicate the equivalent between formal and informal affixes.

Sufiks -an (suffix -an)	Data	Bentuk Baku (Standard Form)	
D+ -an	motoran (motorcycling)	berkendara dengan motor (motorcycling)	
	seberangan (be opposite)	berseberangan (be opposite)	
	temenan (be friends)	berteman (be friends)	
	chatan (chatting)	berkirim pesan (messaging)	
	facebookan (using facebook)	berfacebookan (using facebook)	
	pelukan (hugging)	berpelukan (hugging)	
	larian (running)	berlarian (running)	

Table 1. Data Sufiks –an (Table 1. Suffix data –an)

3 Result and Discussion

This section begins by presenting the form of informal affixes followed by examples of words with informal affixes and variations of their formal forms, as well as analyzing their meaning. Next, the results of the analysis were developed as teaching materials. The data found are in the form of informal affixes forming verbs and forming adjective.

3.1 Verb Forming Informal Afixation

Afiks informal pembentuk verba pada data terdiri ada prefiks, sufiks, dan kombinasi afiks. Data yang berhasil dikumpulkan berupa afiks pembentuk verba dalam *tweet* media sosial *twitter*, disajikan berikut ini.

The informal affixes that form verbs consist of prefixes, suffixes, and combinations of affixes. The finding is presented below.

3.1.1 Suffix -an

When combined with base words, suffix -an does not change the form. The function of this suffix is to create verbs. The following table presents the suffix found in the study.

Table 1 shows that the suffix -an in the data correlates with the prefix ber- in the standard form. Meanwhile, the meaning generated is also correlated with the meaning of the prefix ber-. Some of the base word are verbs and some are nouns, the suffix makes verbs out of both types. The meaning is generally related to doing the verb or using the noun.

3.1.2 Suffix -in

Sufiks –*in* serves to form transitive verb. This function is somewhat similar to suffix -*kan*. Table 2 contains the finding of the suffix.

Sufiks -an (Suffix -an)	Data	Bentuk Baku (Standard Form)
D+-in	doain (pray)	doakan (pray for)
	pasrahin (surrender)	pasrahkan (give it up)
	lepasin (let go)	lepaskan (let go)
	dapetin (get it)	dapatkan (get)
	keluarin (get it out)	keluarkan (take it out)
	tuangin (pour)	tuangkan (pour)
	fotoin (take a photo)	fotokan (take a photo)
	hitamin (blacken)	hitamkan (blacken)
	masukin (insert)	masukan (input)
	maafin (sorry)	maafkan (sorry)
	rasain (feel)	rasakan (feel)
	ceritain (tell me)	ceritakan (tell me)

Table 2. Data Sufiks –*in* (Table 2. Suffix data –*in*)

Table 2 shows how informal affix -in correlates with suffix -kan in formal form. The base words are in the types of vebs, adjectives, noun. The suffix produce verbs from them, with the meaning related to doing the verb, creating the state of the adjective, or delivering/asking for the noun.

3.1.3 Prefix *ke-*

Prefix ke- is usually related to the meaning of accidental. The Table 3 presents the informal affix in verb forming role.

Prefiks ke- (Prefix ke-)	Data	Bentuk Baku (Standard Form)
D + ke-	keminum (drink)	terminum (drunk)
	ketawa (laugh)	tertawa (laugh)
	ketuduh (accuse)	tertuduh (accused)
	kemasak (cook)	termasak (cooked)
	ketipu (fooled)	tertipu (tricked)
	kekunci (looked)	terkunci (locked)
	ketutup (closed)	tertutup (closed)

Table 3. Data Prefiks *ke*- (Table 3. Prefix data *ke*-)

Kombinasi <i>di-in</i> (Combination <i>di-in</i>)	Data	Bentuk Baku (Standard form)
D + di-in	dikagumin (be admired)	dikagumi (be admired)
	ditinggalin (be left)	ditinggalkan (abandoned)
	disalahin (be blamed)	disalahkan (beblamed)
	diduain (be cheated on)	diduakan (be cheated on)
	diputusin (be broken up)	diputuskan (be broken up)
	diaduin (complained)	diadukan (complained)
	dibenerin (be justified)	dibenarkan (be justified)

Table 4. Data Kombinasi *di-in* (Table 4. Combination data *di-in*)

Table 3 shows that prefix *ke*- correlates with prefix *ter*- in standard form. The data come from base form of verb and noun. The suffix produce verbs from them with meaning of accidental, unintentional, or something that is done by others to the subject.

3.1.4 Combination di-in

The use of combination di-in creates a new meaning related to passive verb. Table 4 presents the findings related to this combination.

On Table 4, it can be seen that informal affix combination *di-in* correlates with formal form affix *di-kan* and *di-i*. The base word comes from verb, adjective, numeralia, which then the combination will create verbs from. The meaning relates to passive verbs, as in when an action is done by others to the subject.

3.2 Adjective Forming Informal Affix

This group of informal affix consists of suffix -an and confix ke-an. The following is a discussion and distribution of informal affixes forming adjectives.

Table 5 shows that some of the suffix -an correlate with formal form with pattern lebih (more) + base word. Semantically, this relates to comparative meaning. There are also the pattern of terlalu (too) + base word. In these cases, the class of words does not change with the affixation.

3.3 The Use of Informal Affixes as an Alternative to Indonesian Language Teaching Materials in Senior High Schools (SMA)

Indonesian language learning activities in the 2022 curriculum has writing elements in phase F (generally grades XI and XII). The Learning Outcome (CP): *students are able to write ideas and thoughts in simple news texts*. This requires linguistic analysis in writing a text. In analyzing the language of a text, it cannot be separated from the rules or conventions regarding word formation. These processes and rules are included in morphological processes. The morphological process is basically the formation of words

Afiks Informal Adjektiva (Adjective Informal Affix)	Data	Bentuk Baku (Standard form)
D+-an	sabaran (more patient)	lebih sabar (more patient)
	gantengan (more handsome)	lebih ganteng (more handsome)
	cantikan (prettier)	lebih cantik (more beautiful)
D + ke-an	kemahalan (too expensive)	terlalu mahal (too expensive)
	kepanjangan (too long)	terlalu panjang (too long)
	ketebalan (too thick)	terlalu tebal (too thick)
	kemanisan (too sweet)	terlalu manis (too sweet)

Table 5. Data Afiks Informal Adjektiva (Table 5. Adjective Informal Affix Data)

from a basic form with one of the processes, namely informal affixation. Formation of words must follow the rules of word formation so that misunderstandings do not occur regarding the meanings formed. If the words formed have the appropriate meaning, the reader will easily understand.

Learning outcomes (CP) about writing ideas and thoughts in news texts can be linked to research results related to informal affixation in Twitter tweets. Of course, when writing a text, pay attention to the language used. Moreover, in the language of the news text, there is the use of standard words. Therefore, formal and informal affixation teaching materials are given. Informal affixes are affixes that should be used in informal language. Informal affixes are affixes that should not be used in formal language, such as "ceritain" and "ceritakan" in formal language. After studying the material, students can determine the pattern of presentation and the language used in writing news texts in Indonesian correctly according to the context.

Students were taught using what were essentially informal affixes, where formal affixes formed verbs and informal affixes formed adjectives. Different languages make use of the two affixes. In comparison to formal affixes, informal affixes are employed in informal languages. Both types of affixes must be understood by students and taught how to use them correctly in their respective language variations.

The learning process consist of preliminary, core, and closing activities. Preliminary activities begun with greetings, then the teacher coordinated the class atmosphere, conducted attendance, and assesses attendance. The core activities were filled with observations, asking questions, identifying formal and informal words in news texts, and detailing them based on their affixes. The activity continued to analyze formal and informal affixes in the teacher's Power Point and presentation. The teacher and other students respond and provide feedback related to the results of discussions regarding formal and informal affixes. After that, students were trained to apply the use of formal affixes to standard language and informal affixes to non-formal language varieties. The activity concluded with conclusions. In the closing activity, the teacher and students reflect.

After providing follow-up, the teacher closes the lesson. The learning method utilized was discovery learning.

This study is relevant with [28–30] regarding informal affixation. These studies have similarity with this research: all found -an suffix, -in suffix, ke-prefix, combinations di-in, and informal affixations that form adjectives. Meanwhile, the differences are varied; previous studies discovered affixes such as the N- prefix, N-in combination, m-in prefix, m-in combination, di- prefix, nge- prefix, -i suffix, -nya suffix, N- simulfix, N confix, prefixes ber- and meN-, inserting consonants /p/, /g/, /s/, and the vowel behind following the vowel of the syllable in front, and inserting /ok/ after the first letter of the main word, and adverb-forming informal affixation. Those affixes were not found in this study. However, those research was not linked to learning.

The findings of this research can be concluded as the following. The affixes referred to are (1) informal affixes that form verbs: -an suffix, -in suffix, ke- prefix, di-in combination; and (2) informal affixes that form adjectives: -an affix and ke-an affix. (2) The results of this study were implemented in learning Indonesian. Meanwhile, the Learning Outcomes (CP): students are able to express ideas and thoughts in simple news texts. In the linguistic structure of the news text, there is the use of standard or formal words. References to teaching materials are found in the results of this study in the form of informal affixes that are paired with formal affixes. Students must be able to know the forms of words that go through the process of informal affixes and formal affixes in Indonesian and be able to interpret and apply the proper use of these two types of affixes to words and sentences. The teacher can teach the affixation process to students so that they can use good and correct Indonesian.

This study has a limited focus, namely the process of forming words when experiencing informal affixation processes. The results of this study should not only be implemented for writing a text but also be implied for analyzing linguistic structures. In addition to being able to write a text, students are also able to analyze the language in a text.

Acknowledgments. The author thanks the Muhammadiyah University of Surakarta, which has supported and assisted with the funding and process of publishing articles. Thanks also go to colleagues, editors, and article reviewers who have provided directions, input, and suggestions for improving the quality of articles.

Author's Contribution. The main author's contribution was to write down the ideas and thoughts contained in the entire research process and then write the articles. Articles are presented to readers with the aim of conveying the results of scientific analysis, and it is hoped that readers can use them as a source of reference for similar research. The second author contributed input, corrected the results of the analysis, and improved the article.

References

- A. Arizal and S. Alim, "Pengalian Informasi Penting yang Tersembunyi dalam Tweet dari Data Stream Micro Blogging," Pros. Semin. Tek. Elektro dan Pendidik. Tek. Elektro (STE 2013), November, 2015, [Online]. Available: https://www.researchgate.net/profile/Arif-Muji/public ation/283641060
- S. Farhati and R. A. Fitriawan, "Analisis Wacana Kritis Opini Publik Tentang Lgbt Dalam Autobase Twitter@ tubirfess," e-Proceedings Manag., vol. 9, no. 2, pp. 957–965, 2022, [Online]. Available: https://openlibrarypublications.telkomuniversity.ac.id/index.php/management/article/view/17769%0Ahttps://openlibrarypublications.telkomuniversity.ac.id/index.php/management/article/view/17769/17517
- 3. N. S. Cenderamata, R. C. & Agus, "Abreviasi dalam Percakapan Sehari-Hari di Media Sosial: Suatu Kajian Morfologi," *Metahumaniora*, vol. 8, no. 2, p. 238, 2018, [Online]. Available: https://journals.ums.ac.id/index.php/KLS/article/view/6284
- 4. H. H. S. Domas Sugrahita Harja Susetya, "Kesalahan Morfologi Bahasa Indonesia Pada Buletin Aktualita Lembaga Pers Mahasiswa Aspiratif UNZAH," *Bahtera Indones.*, vol. 7, no. 2, 2022, https://doi.org/10.31943/bi.v7i2.208.
- 5. I. Siregar, "Monograf," pp. 1–61, 2009, [Online]. Available: http://repository.unas.ac.id/867/1/Monograf Morfologi.pdf.
- 6. M. R. Fauzan, "Analisis Penggunaan Afiks Bahasa Indonesia dalam Status Blackberry Messenger Mahasiswa Kelas C Angkatan 2012 Program Studi Pendidikan Bahasa," *J. Bhs. dan Sastra*, vol. 2, pp. 61–76, 2017, [Online]. Available: https://core.ac.uk/download/pdf/289713 861.pdf
- 7. E. I. Gustiani and A. Fujiastuti, "Afiksasi Pada Rubrik Tajuk Rencana Surat Kabar Kedaulatan Rakyat," *Kode J. Bhs.*, vol. 11, no. 1, pp. 172–183, 2022, https://doi.org/10.24114/kjb.v11i1. 33505.
- I. L. Ningtias and Kisyani, "Afiksasi pada Teks Bacaan Buku Siswa Mata pelajaran Bahasa Indonesia Tingkat Sekolah Menengah Atas (Kajian Morfologi)," J. Bhs. dan Sastra Indones., vol. 9, no. 9, p. 26, 2022, [Online]. Available: https://ejournal.unesa.ac.id/index.php/bapala/ article/view/48134
- 9. B. Hidayah, "Afiksasi Kata Kerja Masa Lampau dalam Bahasa Arab dan Bahasa Indonesia," *Tafaqquh*, vol. 1, no. 2, pp. 114–130, 2013, https://doi.org/10.52431/tafaqquh.v1i2.16.
- 10. J. S. Amma Khoirotul Bariyah, Agus Darmuki, "Analisis Afiksasi Pada Kolom Jati Diri Di Surat Kabar Jawa Pos Edisi 6 Januari–4 Februari 2021 Dan Hubungannya Dengan Pembelajaran Bahasa Indonesia Di Sma," *J. Pendidik. Edutama*, pp. 1–6, 2021, [Online]. Available: https://ejurnal.ikippgribojonegoro.ac.id/index.php/JPE
- 11. R. Asih, M. Ekawati, and T. P. Ratna N. H, "Afiksasi dan Zeroisasi pada Lirik Lagu Payung Teduh dalam Album Live and Loud sebagai Formulasi Materi Ajar di SMA," *Repetisi Ris. Pendidik. Bhs. dan Sastra Indones.*, vol. 3, no. 1, pp. 40–53, 2020, https://doi.org/10.31002/repetisi.v3i1.1019.
- 12. C. I. Putri, "Analisis Afiksasi Lirik Lagu Album 'Cinta Luar Biasa' Andmesh Kamaleng sebagai Alternatif Bahan Ajar Menulis Teks Persuasi di SMP kelas VIII," *Pros. Semin. Literasi V*, pp. 157–166, 2020, [Online]. Available: http://conference.upgris.ac.id/index.php/snl/article/view/1671/771
- 13. I. N. Hasanah, S. Widayati, and D. Ratnaningsih, "Afiksasi Pembentukan Verba dalam Majalah Tempo 'Darurat Covid-19' Edisi 23–29 Maret 2020 sebagai alternatif Bahan Ajar di Sekolah Menengah Atas," *J. Griya Cendekia*, vol. 7, pp. 383–397, 2020, https://doi.org/10.47637/griya-cendikia.v7i2.314.
- 14. M. Jannah, "Afiksasi (Prefiks dan Sufiks) dalam Kolom Ekonomi Bisnis di Koran Jawa Pos Edisi Kamis 14 November 2019," *J. Disastri*, vol. 2, no. November 2019, pp. 18–25, 2020, [Online]. Available: https://garuda.kemdikbud.go.id/documents/detail/2485984

- 15. F. P. Ananda, "Afiksasi Dalam Kolom Politik Di Koran Jawa Pos Edisi Jumat 1 November 2019," *J. Disastri (Jurnal Pendidik. Bhs. dan Sastra Indones.*, vol. 2, no. 1, pp. 9–17, 2020, https://doi.org/10.33752/disastri.v2i1.873.
- 16. I. R. Mahadi, I. Siagian, and Y. Yolanda, "Kesalahan Afiksasi dalam Karangan Teks Eksposisi dan Implikasinya terhadap Pembelajaran Bahasa Indonesia," *Sinastra*, vol. 1, pp. 20–29, 2022, [Online]. Available: http:// proceeding.unindra.ac.id/index.php/sinastra/article/view/6060%0Ahttp://proceeding.unindra.ac.id/index.php/sinastra/article/viewFile/6060/1632
- 17. B. D. Milandari, S. Muhdar, and Nurmiwati, "Kesalahan Pemakaian Afiksasi pada Berita Politik di Surat Kabar Lombok Post," *J. Ilm. Telaah*, vol. 5, no. 2, pp. 71–78, 2020, https://doi.org/10.31764/telaah.v5i2.2659.
- 18. D. Sutrisna, "Analisis Kesalahan Morfologi Bahasa Indonesia dalam Surat Kabar Radar Majalengka Edisi 16 dan 25 April 2016," *Diglosia*, vol. 1, no. 2, pp. 64–73, 2018, [Online]. Available: https://jurnal.unma.ac.id/index.php/dl/article/view/426
- 19. P. Riansyah, E. Boeriswati, and A. Rahmawati, "Afiksasi Pada Karangan Anak Usia 10–12 Tahun di Kuningan, Jawa Barat: Sebuah Kajian Morfologi," *Arkhais*, vol. 07, no. 2, pp. 53–56, 2016, https://doi.org/10.21009/ARKHAIS.072.01.
- A. E. Rochhayati, B. Waluyo, and F. Kurwidaria, "Menelaah Teks Berita Melalui Pemahaman Menganalisis Afiksasi Wacana Berita," *Sabdasastra*, vol. 4, no. 2, pp. 21–38, 2021, https://doi.org/10.20961/sabpbj.v4i2.65716.
- 21. H. P. Anasti and S. A. Liusti, "Afiksasi dalam Bahasa Kerinci di Daerah Pulau Tengah dan Pemanfaatannya dalam Pembelajaran," vol. 6, no. 3, pp. 3230–3244, 2022, [Online]. Available: https://jbasic.org/index.php/basicedu/article/download/2587/pdf
- 22. A. Muchti and S. Oktavidianty, "Analisis Penggunaan Afiksasi pada Teks Naratif Mahasiswa BIPA di Universitas Bina Darma Lampung," *J. Silistik*, vol. 1, no. 1, pp. 1–8, 2021, [Online]. Available: https://silistik.ejournal.unri.ac.id/index.php/Js/article/view/1
- 23. E. Cahyaningsih and G. Karunia Assidik, "Penerapan Model Pembelajaran Discovery Learning untuk Meningkatkan Minat Belajar pada Materi Teks Berita," *Bul. Pengemb. Perangkat Pembelajaran*, vol. 3, no. 1, pp. 1–7, 2021, https://doi.org/10.23917/bppp.v3i1.19385.
- D. R. Pratiwi, "Pemanfaatan Komik Strip Sebagai Alternatif Pengembangan Bahan Ajar Memproduksi Cerita Ulang Di SMA," Semin. Nas. Pendidkan Bhs. Indones., no. 20, pp. 281–287, 2015, [Online]. Available: https://publikasiilmiah.ums.ac.id/bitstream/handle/11617/6374/DiniRestiyanti Pratiwi.pdf?sequence=1
- 25. A. Bawamenewi, "Pengembangan Bahan Ajar Memprafrasekan Puisi 'Aku' Berdasarkan Model Pembelajaran Based Learning (PBL)," *J. Rev. Pendidik. dan Pengajaran*, vol. 2, pp. 310–323, 2019, https://doi.org/10.31004/jrpp.v2i2.631.
- K. Sholeh, "Prasasti Talang Tuo Peninggalan Kerajaan Sriwijaya sebagai Materi Ajar Sejarah Indonesia di Sekolah Menengah Atas," *J. Hist.*, vol. 5, 2017, https://doi.org/10.22146/db.v4i1. 4111.
- 27. K. Nisa, "Analisis Kesalahan Berbahasa pada Berita dalam Media Surat Kabar Sinar Indonesia Baru," *J. Bind. Sastra*, vol. 5305, pp. 218–224, 2018, https://doi.org/10.32502/jbs.v2i2.1261.
- 28. S. Sunarti and D. Winarti, "Fenomena Afiks Informal Bahasa Indonesia dalam Media Sosial Twitter," *Deskripsi Bhs.*, vol. 4, no. 1, pp. 34–43, 2021, https://doi.org/10.22146/db.v4i1.4111.
- 29. W. Mulyani, "Bentuk Afiksasi Ragam Bahasa Remaja Dalam Novel," *J. Bastra*, vol. 2, no. 2, pp. 1–14, 2015, [Online]. Available: https://core.ac.uk/download/pdf/228862823.pdf
- N. Masfufah, "Afiksasi dalam Bahasa Indonesia Ragam Gaul di Kota Samarinda: Sebuah Kajian Morfologi," *J. Ketatabahasaan dan kesusastraan*, vol. 9, no. 1, pp. 77–85, 2014, https://doi.org/10.26499/loa.v9i1.2067.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (http://creativecommons.org/licenses/by-nc/4.0/), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

